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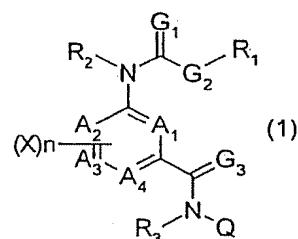
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(54) **INSECTICIDE FOR AGRICULTURAL OR HORTICULTURAL USE AND METHOD OF USE THEREOF**

(57) An object of the present invention is to provide insecticides having high effectiveness. The present invention provides compounds represented by formula (1):



Description**Technical Field**

5 [0001] The present invention relates to compounds represented by formula (1), insecticides containing the compounds as active ingredients, a method for producing the insecticides, and a method for using the insecticides.

Background Art

10 [0002] PCT Japanese Translation Patent Publication No. 11-511442 discloses salicylic compounds similar to compounds of the present invention. However, compounds represented by formula (1) of the present invention do not have a salicylic skeleton, and the compounds disclosed in the above publication are clearly outside the scope of claims of the present invention.

15 [0003] Publication No. WO2003-22806 discloses compounds as production intermediates similar to the compounds of the present invention, but it does not disclose an activity to insects. Also, the compounds disclosed in the publication are clearly outside the scope of claims of the present invention.

20 [0004] J. Org. Chem. 142 (1966) discloses compounds as production intermediates similar to the compounds of the present invention, but it does not disclose an activity to insects. Also, the compounds disclosed in the publication are clearly outside the scope of claims of the present invention.

25 [0005] J. Am. Chem. Soc. 6382 (2000) discloses compounds as production intermediates similar to the compounds of the present invention, but it does not disclose an activity to insects. Also, the compounds disclosed in the publication are clearly outside the scope of claims of the present invention.

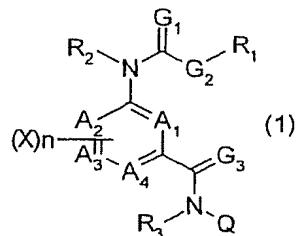
Disclosure of Invention

30 [0006] An object of the present invention is to provide insecticides having high effectiveness.

35 [0007] As a result of intensive research for achieving the object, the inventors found that the compounds of the present invention are novel compounds not disclosed in any document and have an excellent insecticidal effect, and the compounds can be used as new insecticides. It is also found that intermediates in production of the compounds of the present invention are not disclosed in any document and are useful production intermediates. The present invention has been achieved based on these findings.

[0008] The present invention provides compounds represented by the following formulae:

[1] Compounds represented by formula (1)



wherein A_1 , A_2 , A_3 , and A_4 independently represent a carbon atom, a nitrogen atom, or an oxidized nitrogen atom; R_1 represents a C1-C6 alkyl group which may be substituted, a phenyl group which may be substituted, or a heterocyclic group which may be substituted; R_2 and R_3 independently represent a hydrogen atom, a C1-C4 alkyl group which may be substituted, or a C1-C4 alkylcarbonyl group which may be substituted; G_1 , G_2 , and G_3 independently represent an oxygen atom or a sulfur atom; X s may be the same or different and each represent a hydrogen atom, a halogen atom, a C1-C4 alkyl group which may be substituted, or an amino group which may be substituted; n represents an integer of 0 to 4; Q represents a phenyl group which may be substituted, a naphthyl group which may be substituted, a tetrahydronaphthyl group which may be substituted, or a heterocyclic group which may be substituted.

[2] Compounds represented by formula (1) wherein A_1 , A_2 , A_3 , and A_4 independently represent a carbon atom, a nitrogen atom, or an oxidized nitrogen atom; R_1 represents the following:

are selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, a pentafluorosulfanyl group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, a C1-C4 alkylcarbonyloxy group, and a C1-C4 alkoxy carbonyl group,

5 a heterocyclic group (which represents a pyridyl group, a

pyridine-N-oxide group, a pyrimidinyl group, a pyridazyl group, a furyl group, a tetrahydrofuryl group, a thienyl group, a tetrahydrothienyl group, a tetrahydropyranyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, a pyrrole group, an imidazolyl group, a triazolyl group, a pyrazolyl group, or a tetrazolyl group), or

10 a substituted heterocyclic group (which represents a pyridyl group, a pyridine-N-oxide group, a pyrimidinyl group, a pyridazyl group, a furyl group, a tetrahydrofuryl group, a thienyl group, a tetrahydrothienyl group, a tetrahydropyranyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, a pyrrole group, an imidazolyl group, a triazolyl group, a pyrazolyl group, or a tetrazolyl group) having one or more substituents which may be the same or different and which are selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, a pentafluorosulfanyl group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, a C1-C4 alkylcarbonyloxy group, and a C1-C4 alkoxy carbonyl group), and

15 Z_1 represents -O-, -S-, -SO₂-, -C(=O)-, -C(=O)O-, -OC(=O)-, -N(R₅)-, -C(=O)N(R₅)-, or -N(R₅)C(=O)- (R₅ represents a hydrogen atom, a C1-C4 alkyl group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, or a C1-C4 alkoxy carbonyl group), or -E₂-R₆

20 (wherein E₂ represents a C1-C4 alkylene group, a C2-C4 alkenylene group, a C3-C4 alkynylene group, a C1-C4 haloalkylene group, a C2-C4 haloalkenylene group, or a C3-C4 haloalkynylene group, and R₆ represents a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a cyano group, a nitro group, a hydroxyl group, a phenyl group,

25 a substituted phenyl group having one or more substituents which may be the same or different and which are selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, a pentafluorosulfanyl group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, a C1-C4 alkylcarbonyloxy group, and a C1-C4 alkoxy carbonyl group,

30 a naphthyl group,

35 a substituted naphthyl group having one or more substituents which may be the same or different and which are selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, a pentafluorosulfanyl group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, a C1-C4 alkylcarbonyloxy group, and a C1-C4 alkoxy carbonyl group,

40 a heterocyclic group (which represents a pyridyl group, a

pyridine-N-oxide group, a pyrimidinyl group, a pyridazyl group, a furyl group, a tetrahydrofuryl group, a thienyl group, a tetrahydrothienyl group, a tetrahydropyranyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, a pyrrole group, an imidazolyl group, a triazolyl group, a pyrazolyl group, or a tetrazolyl group), or

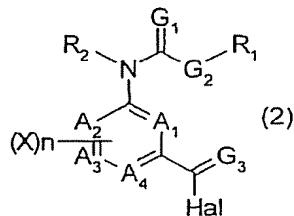
45 a substituted heterocyclic group (which represents a pyridyl group, a pyridine-N-oxide group, a pyrimidinyl group, a pyridazyl group, a furyl group, a tetrahydrofuryl group, a thienyl group, a tetrahydrothienyl group, a tetrahydropyranyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, a pyrrole group, an imidazolyl group, a triazolyl group, a pyrazolyl group, or a tetrazolyl group) having one or more substituents which may be the same or different and which are selected from a halogen atom, a

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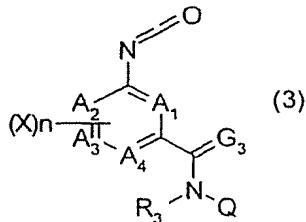
group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, and a pentafluorosulfanyl group (excluding a case (1) in which Q represents 3,4-dichlorophenyl when R1 represents a methyl group, a case (2) in which Q represents an unsubstituted phenyl group when R1 represents an ethyl group, and a case (3) in which Q represents an unsubstituted pyridyl group when R1 represents an unsubstituted phenyl group).

[3] Compounds represented by formula (2)



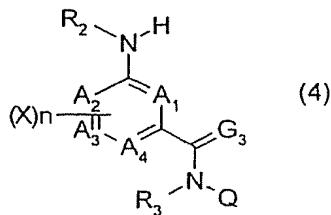
wherein A₁, A₂, A₃, A₄, R₁, R₂, R₃, G₁, G₂, G₃, X, and n each represent the same as in formula [1], and Hal represents a halogen atom.

[4] Compounds represented by formula (3)

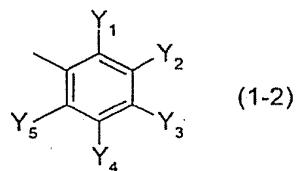


wherein A₁, A₂, A₃, A₄, R₃, G₃, X, n and Q each represent the same as in formula [1].

[5] Compounds represented by formula (4)



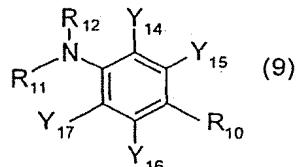
wherein A₁, A₂, A₃, A₄, R₂, R₃, G₃, X, and n each represent the same as in formula [1], and Q represents a group represented by formula (1-2) or (1-3):



(wherein Y₁, Y₂, Y₄, and Y₅ may be the same or different and each represent a hydrogen atom, a halogen atom, a

wherein R₇ represents a C1-C6 haloalkyl group, Y₁₀, Y₁₁, Y₁₂, and Y₁₃ may be the same or different and each represent a hydrogen atom, a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a pentafluorosulfanyl group, a cyano group, or a nitro group, and R₈ and R₉ independently represent a hydrogen atom, a C1-C4 alkyl group, a m-nitrobenzoyl group, or a substituted m-nitrobenzoyl group, and m represents 0, 1, or 2.

[10] Aniline derivatives represented by formula (9):



wherein R₁₀ represents a C1-C6 haloalkyl group which may be substituted by at least one hydroxyl group, Y₁₄, Y₁₅, Y₁₆, and Y₁₇ may be the same or different and each represent a hydrogen atom, a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a pentafluorosulfanyl group, a cyano group, or a nitro group, and R₁₁ and R₁₂ independently represent a hydrogen atom, a C1-C4 alkyl group, a m-nitrobenzoyl group, or a substituted m-nitrobenzoyl group.

[11] An insecticide comprising any one of the compounds in [1] or [2] as an active ingredient.

[12] A method for using a chemical comprising treating a useful crop or soil with an effective amount of any one of the compounds [1] or [2], for protecting the useful crop from harmful organisms.

[13] A method for preventing pests comprising using the compound [1] or [2] and at least one insecticide and/or fungicide in combination.

[0009] The compounds of the present invention exhibit an excellent preventive effect as insecticides in low dosages, and also exhibit an excellent preventive effect when being used in combination with another insecticide, an acaricide, a nematocide, a fungicide, a herbicide, a plant growth regulator, or a biological pesticide.

Best Mode for Carrying Out the Invention

[0010] In the definitions of formula (1) of the present invention, the term "halogen atom" means a fluorine atom, a chlorine atom, a bromine atom, or an iodine atom. The characters "n-", "i-", "s-", and "t-" mean "normal", "iso", "secondary", and "tertiary", respectively. With respect to the expression "Ca-Cb" (a and b each represent an integer of 1 or more), for example, "C1-C6" means that the number of carbon atoms is 1 to 6, "C3-C8" means that the number of carbon atoms is 3 to 8, and "C1-C4" means that the number of carbon atoms is 1 to 4.

[0011] In the definitions of the formulae such as formula (1) of the present invention, the used terms have the following meanings:

The term "an alkyl group which may be substituted" means a straight, branched or cyclic alkyl group which may be substituted by the same or different groups selected from a hydrogen atom, a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a C1-C6 alkylcarbonyl group, a C1-C6 haloalkylcarbonyl group, a C1-C6 alkoxy carbonyl group, a C1-C6 haloalkoxycarbonyl group, a C1-C6 alkylcarbonyloxy, a C1-C6 haloalkylcarbonyloxy group, an amino group, a C1-C6 alkylamino group, a di-C1-C6 alkylamino group, a phenyl group which may be substituted, a phenylcarbonyl group which may be substituted, a phenylamino group which may be substituted, and a heterocyclic group which may be substituted.

The term "an alkylcarbonyl group which may be substituted" means a straight, branched or cyclic alkylcarbonyl group which may be substituted by the same or different groups selected from a hydrogen atom, a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a C1-C6 alkylcarbonyl group, a C1-C6 haloalkylcarbonyl group, a C1-C6 alkoxy carbonyl group, a C1-C6 haloalkoxycarbonyl group, a C1-C6 alkylcarbonyloxy, a C1-C6 haloalkylcarbonyloxy group, an amino group, a C1-C6 alkylamino group, a di-C1-C6 alkylamino group, a phenyl group which may be substituted.

- 5 The term "a C3-C8 cycloalkyl group" means a cycloalkyl group having 3 to 8 carbon atoms and a cyclic structure, such as cyclopropyl, cyclobutyl, cyclopentyl, 2-methylcyclopentyl, 3-methylcyclopentyl, cyclohexyl, 2-methylcyclohexyl, 3-methylcyclohexyl, or 4-methylcyclohexyl. The term "a C3-C8 halocycloalkyl group" means a cycloalkyl group having 3 to 8 carbon atoms and a cyclic structure and substituted by one or more halogen atoms which may be the same or different, such as 2,2,3,3-tetrafluorocyclobutyl, 2-chlorocyclohexyl, or 4-chlorocyclohexyl.
- 10 The term "a C1-C6 alkoxy group" means a straight or branched alkoxy group having 1 to 6 carbon atoms, such as methoxy, ethoxy, n-propyloxy, isopropyloxy, n-butoxy, s-butoxy, i-butoxy, or t-butoxy. The term "a C1-C6 haloalkoxy group" means a straight or branched haloalkoxy group having 1 to 6 carbon atoms and substituted by one or more halogen atoms which may be the same or different, such as trifluoromethoxy, pentafluoroethoxy, heptafluoro-n-propyloxy, heptafluoro-i-propyloxy, 1,1,1,3,3-hexafluoro-2-propyloxy, 2,2,2-trifluoroethoxy, 2-chloroethoxy, or 3-fluoro-n-propyloxy.
- 15 The term "a C1-C6 alkylthio group" means a straight or branched alkylthio group having 1 to 6 carbon atoms, such as methylthio, ethylthio, n-propylthio, i-propylthio, n-butylthio, s-butylthio, or t-butylthio. The term "a C1-C6 haloalkylthio group" means a straight or branched alkylthio group having 1 to 6 carbon atoms and substituted by one or more halogen atoms which may be the same or different, such as trifluoromethylthio, pentafluoroethylthio, 2,2,2-trifluoroethylthio, heptafluoro-n-propylthio, heptafluoro-i-propylthio, nonafluoro-n-butylthio, or nonafluoro-2-butylthio.
- 20 The term "a C1-C6 alkylsulfinyl group" means a straight or branched alkylsulfinyl group having 1 to 6 carbon atoms, such as methylsulfinyl, ethylsulfinyl, n-propylsulfinyl, i-propylsulfinyl, n-butylsulfinyl, s-butylsulfinyl, or t-butylsulfinyl. The term "a C1-C6 haloalkylsulfinyl group" means a straight or branched alkylsulfinyl group having 1 to 6 carbon atoms and substituted by one or more halogen atoms which may be the same or different, such as trifluoromethylsulfinyl, pentafluoroethylsulfinyl, 2,2,2-trifluoroethylsulfinyl, heptafluoro-n-propylsulfinyl, heptafluoro-i-propylsulfinyl, nonafluoro-n-butylsulfinyl, or nonafluoro-2-butylsulfinyl.
- 25 The term "a C1-C6 alkylsulfonyl group" means a straight or branched alkylsulfonyl group having 1 to 6 carbon atoms, such as methylsulfonyl, ethylsulfonyl, n-propylsulfonyl, i-propylsulfonyl, n-butylsulfonyl, s-butylsulfonyl, or t-butylsulfonyl. The term "a C1-C6 haloalkylsulfonyl group" means a straight or branched alkylsulfonyl group having 1 to 6 carbon atoms and substituted by one or more halogen atoms which may be the same or different, such as trifluoromethylsulfonyl, pentafluoroethylsulfonyl, 2,2,2-trifluoroethylsulfonyl, heptafluoro-n-propylsulfonyl, heptafluoro-i-propylsulfonyl, nonafluoro-n-butylsulfonyl, or nonafluoro-2-butylsulfonyl.
- 30 The term "a C1-C4 alkylcarbonyl group" means a straight, branched, or cyclic alkylcarbonyl group having 1 to 4 carbon atoms, such as acetyl, propionyl, isopropylcarbonyl, or cyclopropylcarbonyl. The term "a C1-C4 haloalkylcarbonyl group" means a straight or branched alkylcarbonyl group having 1 to 4 carbon atoms and substituted by one or more halogen atoms which may be the same or different, such as trifluoroacetyl, pentafluoropropionyl, trichloroacetyl, chloroacetyl, bromoacetyl, or 3-chloropropionyl.
- 35 The term "a C1-C4 alkoxy carbonyl group" means a straight or branched alkoxy carbonyl group having 1 to 4 carbon atoms, such as methoxycarbonyl, ethoxycarbonyl, or isopropyl oxycarbonyl.
- 40 The term "a C1-C4 alkylcarbonyloxy group" means a straight or branched alkylcarbonyloxy group having 1 to 4 carbon atoms, such as acetoxy or propionyloxy. The term "a C1-C4 alkylsulfonyloxy group" means a straight or branched alkylsulfonyloxy group having 1 to 4 carbon atoms, such as methylsulfonyloxy. The term "a C1-C4 haloalkylsulfonyloxy group" means a straight or branched alkylsulfonyloxy group having 1 to 4 carbon atoms and substituted by one or more halogen atoms which may be the same or different, such as trifluoromethylsulfonyloxy or pentafluorooethylsulfonyloxy.
- 45 The term "a C1-C4 alkylene group" means a straight or branched alkylene group having 1 to 4 carbon atoms, such as methylene, ethylene, propylene, dimethylmethylene, or isobutylene. The term "a C2-C4 alkenylene group" means a straight or branched alkenylene group having 2 to 4 carbon atoms and a double bond in its carbon chain. The term "a C3-C4 alkynylene group" means a straight or branched alkynylene having 3 to 4 carbon atoms and a triple bond in its carbon chain. The term "a C1-C4 haloalkylene group" means a straight or branched alkylene group having 1 to 4 carbon atoms and substituted by one or more halogen atoms which may be the same or different, such as chloromethylene, chloroethylene, dichloromethylene, or difluoromethylene.
- 50 The term "a C2-C4 haloalkenylene group" means a straight or branched alkenylene having 2 to 4 carbon atoms and a double bond in its carbon chain, and substituted by one or more halogen atoms which may be the same or different. The term "a C3-C4 haloalkynylene group" means a straight or branched alkynylene group having 3 to 4 carbon atoms and a triple bond in its carbon chain, and substituted by one or more halogen atoms which may be the same or different.
- 55 The term "a C1-C6 haloalkyl group which may be substituted by one or more hydroxyl groups" means a straight or branched alkyl group having 1 to 6 carbon atoms and one or more hydroxyl groups in its carbon chain, and substituted by one or more halogen atoms which may be the same or different, such as 1,2,2,2-tetrafluoro-1-hydroxyethyl, 1,1,1,3,3-hexafluoro-2-hydroxy-2-propyl, 1,1,1,3,3,4,4-octafluoro-2-hydroxy-2-butyl, 1,2,2,3,3,4,4,4-

oethyl, heptafluoro-n-propyl, heptafluoroisopropyl, nonafluoro-n-butyl, or nonafluoro-2-butyl.

Preferably, Y_{10} and Y_{13} are independently hydrogen, C1-C4 alkyl, halogen, or methylthio, and only one of Y_{10} and Y_{13} represents a hydrogen atom. More preferably, Y_{10} and Y_{13} are each chlorine, bromine, or methyl.

Preferably, Y_{11} and Y_{12} are each hydrogen.

Preferably, R_8 and R_9 are each hydrogen, C1-C4 alkyl, m-nitrobenzoyl, or 2-fluoro-3-nitrobenzoyl, and only one of R_8 and R_9 represent C1-C4 alkyl, m-nitrobenzoyl, or 2-fluoro-3-nitrobenzoyl.

Preferably, m is 0, 1, or 2.

Preferably, R_{10} is 1,2,2,2-tetrafluoro-1-hydroxyethyl, 1,1,1,3,3,3-hexafluoro-2-hydroxy-2-propyl, 1,1,1,3,3,4,4,4-octafluoro-2-hydroxy-2-butyl, 1,2,2,3,3,4,4,4-octafluoro-1-hydroxy-n-butyl, or 1,3-dichloro-1,1,3,3-tetrafluoro-2-hydroxy-2-propyl, and more preferably, R_{10} is 1,1,1,3,3,3-hexafluoro-2-hydroxy-2-propyl.

Preferably, Y_{14} and Y_{17} are independently hydrogen, C1-C4 alkyl, halogen, or methylthio, and only one of Y_{14} and Y_{17} represents a hydrogen atom. More preferably, none of Y_{14} and Y_{17} represents a hydrogen atom.

Preferably, Y_{15} and Y_{16} are each hydrogen.

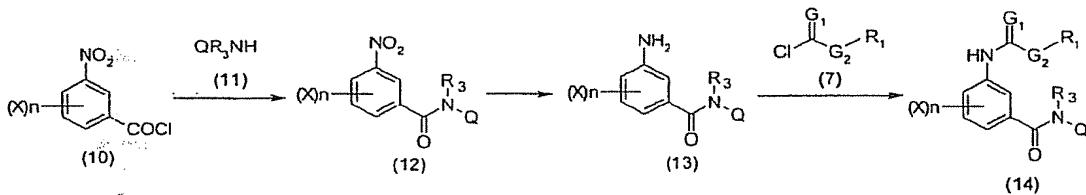
Preferably, R_{11} and R_{12} are each hydrogen, C1-C4 alkyl, m-nitrobenzoyl, or 2-fluoro-3-nitrobenzoyl, and only one of R_{11} and R_{12} represents C1-C4 alkyl, m-nitrobenzoyl, or 2-fluoro-3-nitrobenzoyl.

[0013] Representative processes for producing the compounds of the present invention will be described below. Although the compounds of the present invention can be produced according to the methods, the production processes are not limited to the processes described below.

[0014] An embodiment of the representative processes for producing the compounds of the present invention is Production Method 1 (in the formula, R_1 , R_3 , G_1 , G_2 , $(X)n$, and Q represent the same as described above).

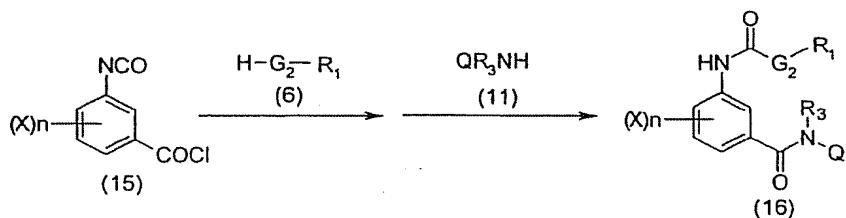
Production Method 1

[0015]



1-(i) Formula (10) → Formula (12)

[0016] A m-nitrobenzoyl chloride derivative represented by formula (10) is reacted with an aromatic amine derivative represented by formula (11) in an appropriate solvent to produce a benzamide derivative represented by formula (12). In this step, an appropriate base can also be used. As the solvent, any solvent which does not significantly inhibit the progress of reaction can be used. Examples of the solvent include aromatic hydrocarbons such as benzene, toluene, and xylene; halogenated hydrocarbons such as dichloromethane, chloroform, and carbon tetrachloride; chained or cyclic ethers such as diethyl ether, dioxane, tetrahydrofuran, and 1,2-dimethoxyethane; esters such as ethyl acetate and butyl acetate; ketones such as acetone, methyl isobutyl ketone, and cyclohexanone; amides such as dimethylformamide and dimethylacetamide; nitriles such as acetonitrile; and inert solvents such as 1,3-dimethyl-2-imidazolidinone. These solvents can be used alone or in a mixture of two or more kinds. Examples of the base include organic bases such as triethylamine, tri-n-butylamine, pyridine, and 4-dimethylaminopyridine; alkali metal hydroxides such as sodium hydroxide and potassium hydroxide; carbonates such as sodium hydrogen carbonate and potassium carbonate; phosphates such as dipotassium hydrogen phosphate and trisodium phosphate; alkali metal hydrides such as sodium hydride; and alkali metal alcoholates such as sodium methoxide and sodium ethoxide. The base may be used in an appropriate amount in the range of molar equivalents of 0.01 to 5 times the amount of the compound represented by formula (10). The reaction temperature may be appropriately determined in the range of -20°C to the reflux temperature of the solvent used, and the reaction time may be appropriately determined in the range of several minutes to 96 hours. The m-nitrobenzoyl chloride derivative represented by formula (10) can be easily produced from a m-nitrobenzoic acid derivative by a conventional method using a halogenating agent. Examples of the halogenating agent include thionyl chloride, thionyl bromide, phosphorus oxychloride, oxalyl chloride, and phosphorus trichloride. In a process for producing the compound represented by formula (12) using the m-nitrobenzoic acid derivative and the compound represented by formula (11) without using a halogenating agent, 1-hydroxybenzotriazole functioning as an additive, and N,N'-dicyclohexyl

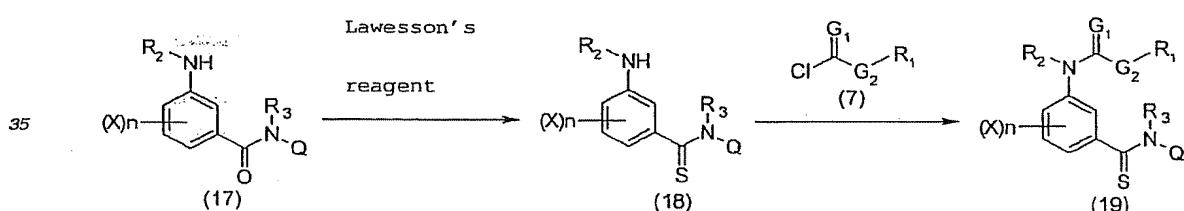


10 [0021] In this step, a solvent can be used. As the solvent, any solvent other than the solvents described in the above document can be used as long as it does not significantly inhibit the progress of reaction. Examples of the solvent include aromatic hydrocarbons such as benzene, toluene, and xylene; halogenated hydrocarbons such as dichloromethane, chloroform, and carbon tetrachloride; chained or cyclic ethers such as dioxane, tetrahydrofuran, and 1,2-dimethoxyethane; esters such as ethyl acetate and butyl acetate; ketones such as acetone, methyl isobutyl ketone, and cyclohexanone; amides such as dimethylformamide and dimethylacetamide; nitriles such as acetonitrile; and inert solvents such as 1,3-dimethyl-2-imidazolidinone. These solvents can be used alone or in a mixture of two or more kinds. Also, a base may be added for accelerating the reaction. Examples of the base other than those disclosed in the above document include organic bases such as triethylamine, pyridine, and 4-dimethylaminopyridine; and inorganic bases such as potassium carbonate. The base may be used in an appropriate amount in the range of molar equivalents of 0.01 to 5 times the amount of the compound represented by formula (15). The reaction temperature may be appropriately determined in the range of -20°C to the reflux temperature of the solvent used, and the reaction time may be appropriately determined in the range of several minutes to 96 hours.

15 [0022] A thioamide compound can be produced from a compound represented by formula (17) using a Lawson reagent according Production Method 3 (in the formula, R₁, R₂, R₃, G₁, G₂, (X) n, and Q represent the same as described above).

20 Production Method 3

25 [0023]



35 3-(i) Formula (17) → Formula (18)

40 [0024] The reaction can be performed under the conditions described in Synthesis, p. 463 (1993) and Synthesis, p. 829 (1984), but the conditions such as a solvent are not limited to those described in these documents.

45 3-(ii) Formula (18) → Formula (19)

50 [0025] A compound represented by formula (19) of the present invention can be produced using a compound represented by formula (7) (for example, a chloroformic ester or a chlorothioformic ester) under the conditions properly selected from the reaction conditions described above in the step 1-(iii) of Production Method 1.

55 [0026] A chloropyridinecarboxylic acid can be used as a starting material. For example, a compound represented by formula (23) can be produced from a chloropyridinecarboxylic acid represented by formula (20) according to Production Method 4 (in the formula, R₁, R₂, R₃, Q, G₁, and G₂ represent the same as described above).

55 Production Method 4

[0027]

4-(iii) Formula (22) → Formula (23)

[0031] A compound represented by formula (23) of the present invention can be produced by using a compound represented by formula (7) (for example, a chloroformic ester or a chlorothioformic ester) under the conditions appropriately selected from the reaction conditions described above in the step 1-(iii) of Production Method 1.

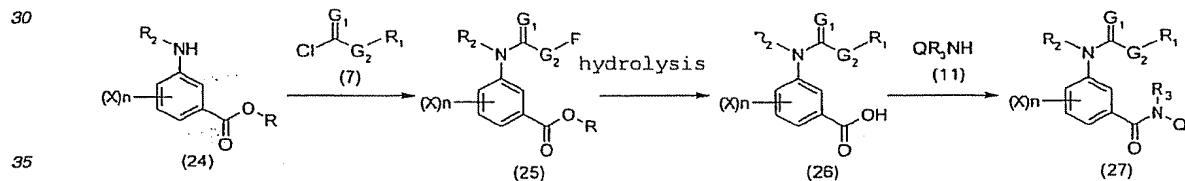
[0032] Even when another nitrogen-containing aromatic carboxylic acid such as 4-chloropyridine-2-carboxylic acid or 6-chloropyridine-2-carboxylic acid is selected as a starting material, the compound of the present invention can be produced according to Production Method 4. In the use of the former starting material, a compound represented by formula (1) wherein A₁ is a nitrogen atom, and A₂, A₃, and A₄ are each a carbon atom can be produced. In the use of the latter starting material, a compound represented by formula (1) wherein A₁, A₂, and A₃ are each a carbon atom, and A₄ is a nitrogen atom can be produced.

[0033] The compound represented by formula (23) is reacted with an appropriate oxidizing agent to produce a corresponding pyridine-N-oxide derivative according to the conditions disclosed in, for example, J. Org. Chem., p. 8576 (1999). Examples of the oxidizing agent include organic peroxy acids such as m-chloroperoxybenzoic acid; sodium metaperiodate; hydrogen peroxide; ozone; selenium dioxide, chromic acid; dinitrogen tetroxide; acyl nitrate; iodine; bromine; N-bromosuccinimide; iodosylbenzene; and t-butyl hypochlorite. The solvent used in this step is not limited to those disclosed in the above document, and any solvent which does not significantly inhibit the progress of reaction may be used. The solvents can be used alone or in a mixture of one or more kinds. In particular, a polar solvent is preferred. The reaction temperature may be appropriately determined in the range of -20°C to the reflux temperature of the solvent used, and the reaction time may be appropriately determined in the range of several minutes to 96 hours.

[0034] A compound represented by formula (27) of the present invention can be produced from a easily available m-aminobenzoic ester derivative presented by formula (24) according to Production Method 5 (in the formula, R₁, R₂, R₃, G₁, G₂, (X)n, and Q represent the same as described above, and R represents a lower alkyl group).

25 Production Method 5

[0035]



5-(i) Formula (24) → Formula (25)

[0036] A compound represented by formula (25) can be produced by using a compound represented by formula (7) (for example, a chloroformic ester or a chlorothioformic ester) under the conditions appropriately selected from the reaction conditions described above in the step 1-(iii) of Production Method 1.

5-(ii) Formula (25) → Formula (26)

[0037] A compound represented formula (26) can be produced by hydrolysis with an alkali metal hydroxide such as sodium hydroxide or potassium hydroxide, an alkali earth metal hydroxide such as calcium hydroxide, or an inorganic acid such as hydrochloric acid or sulfuric acid according to a conventional technique.

50 5-(iii) Formula (26) → Formula (27)

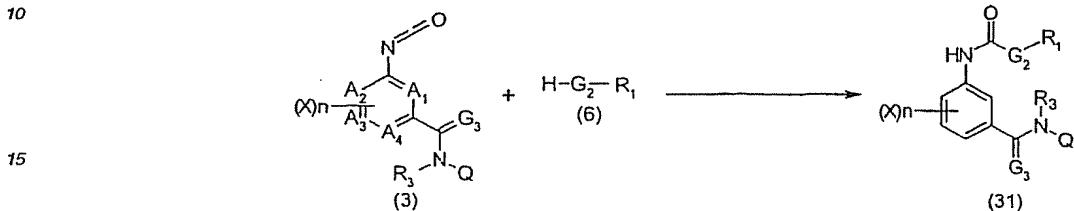
[0038] A compound represented by formula (27) of the present invention can be produced by condensation reaction under appropriate conditions according to the technique described above in the step 4-(i) of Production Method 4. Among the techniques described in the step 4-(i), in the technique using a halogenating agent, the compound represented by formula (27) can be produced through a compound represented by formula (2):

above in the steps 5-(ii) and 5-(iii) of Production Method 5 under appropriate conditions.

[0044] A compound represented by formula (31) of the present invention can be produced according to Production Method 7 (in the formula, A₁, A₂, A₃, A₄, R₁, R₃, G₂, G₃, and (X)n each represent the same as described above).

5 Production Method 7

[0045]

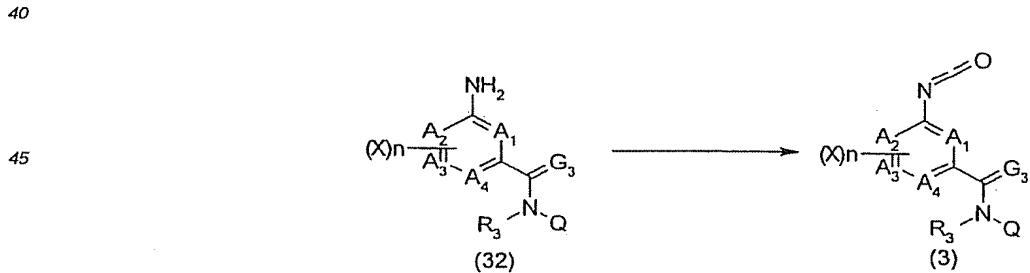


[0046] In this step, an appropriate solvent may be used. As the solvent, any solvent which does not significantly inhibit the progress of reaction can be used. Examples of the solvent include aromatic hydrocarbons such as benzene, toluene, and xylene; halogenated hydrocarbons such as dichloromethane, chloroform, and carbon tetrachloride; chained or cyclic ethers such as diethyl ether, dioxane, tetrahydrofuran, and 1,2-dimethoxyethane; esters such as ethyl acetate and butyl acetate; ketones such as acetone, methyl isobutyl ketone, and cyclohexanone; amides such as dimethylformamide and dimethylacetamide; nitriles such as acetonitrile; and inert solvents such as 1,3-dimethyl-2-imidazolidinone. These solvents can be used alone or in a mixture of two or more kinds. Also, an appropriate base may be used. Examples of the base include organic bases such as triethylamine, tri-n-butylamine, pyridine, 4-dimethylaminopyridine; alkali metal hydroxides such as sodium hydroxide and potassium hydroxide; carbonates such as sodium hydrogen carbonate and potassium carbonate; alkali metal hydrides such as sodium hydride; and alkali metal alcoholates such as sodium methoxide and sodium ethoxide. The amount of the base used may be appropriately determined in the range of molar equivalents of 0.01 to 5 times the amount of the compound represented by formula (6). The reaction temperature may be appropriately determined in the range of -20°C to the reflux temperature of the solvent used, and the reaction time may be appropriately determined in the range of several minutes to 96 hours.

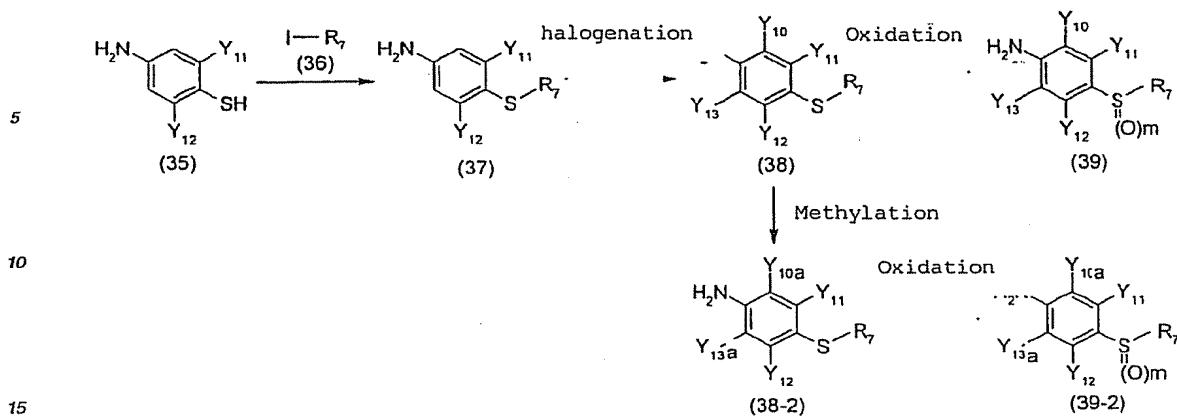
[0047] An isocyanate compound represented by formula (3) can be produced by Production Method 8 (in the formula, A₁, A₂, A₃, A₄, G₃, R₃, (X)n, and Q each represent the same as described above) using a m-aminobenzamide derivative or a m-aminopyridinecarboxamide derivative represented by formula (32) as a starting material.

Production Method 8

[0048]



[0049] In this step, reaction can be performed by using phosgene according to the technique described in Organic Syntheses, Coll., Vol. II, p. 453. An isocyanate compound represented by formula (3) can also be produced by using a phosgene dimer, triphosgene, or oxalyl chloride instead of phosgene. In this step, an appropriate solvent may be used. As the solvent, any solvent which does not significantly inhibit the progress of reaction can be used. Examples of the solvent include aromatic hydrocarbons such as benzene, toluene, and xylene; halogenated hydrocarbons such as dichloromethane, chloroform, and carbon tetrachloride; chained or cyclic ethers such as diethyl ether, dioxane, tetrahydrofuran, and 1,2-dimethoxyethane; esters such as ethyl acetate and butyl acetate; ketones such as acetone, methyl isobutyl ketone, and cyclohexanone; amides such as dimethylformamide and dimethylacetamide; nitriles such as ace-



10-(i) Formula (35) → Formula (37)

20 [0055] A compound represented by formula (38) can be produced by reaction of aminothiophenol represented by formula (35) with a haloalkyl iodide represented by formula (36) according to the method described in J. Fluorine Chem., p. 207 (1994).

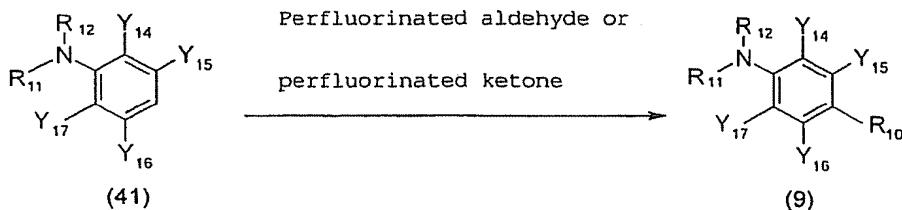
25 [0056] Examples of a haloalkyl iodide represented by formula (36) include trifluoromethyl iodide, pentafluoroethyl iodide, heptafluoro-n-propyl iodide, heptafluoroisopropyl iodide, nonafluoro-n-butyl iodide, and nonafluoroisopropyl iodide. The amount of the haloalkyl iodide used may be appropriately determined in the range of molar equivalents of 1 to 10 times the amount of the compound represented by formula (35). The solvent used in this step is not limited to those described in the above document, and any solvent which does not significantly inhibit the progress of reaction can be used as the solvent. Examples of the solvent include aromatic hydrocarbons such as benzene, toluene, and xylene; halogenated hydrocarbons such as dichloromethane, chloroform, and carbon tetrachloride; chained or cyclic ethers such as diethyl ether, dioxane, tetrahydrofuran, and 1,2-dimethoxyethane; esters such as ethyl acetate and butyl acetate; ketones such as acetone, methyl isobutyl ketone, and cyclohexanone; amides such as dimethylformamide and dimethylacetamide; nitriles such as acetonitrile; and inert solvents such as 1,3-dimethyl-2-imidazolidinone and hexamethylphosphoric triamide. These solvents can be used alone or in a mixture of two or more kinds. In particular, a polar solvent is preferred. The reaction temperature may be appropriately determined in the range of -20°C to the reflux temperature of the solvent used, and the reaction time may be appropriately determined in the range of several minutes to 96 hours.

30 10-(ii) Formula (37) → Formula (38)

40 [0057] A compound represented by formula (38) can be produced by using an appropriate halogenating agent according to the technique described in, for example, Synth. Commun., p. 1261 (1989). Examples of the halogenating agent include chlorine, bromine, iodine, N-chlorosuccinimide, N-bromosuccinimide, and N-iodosuccinimide. The amount of the halogenating agent used may be appropriately determined in the range of molar equivalents of 1 to 10 times the amount of the compound represented by formula (37). The number of equivalents of the halogenating agent used can be appropriately determined so that only Y₁₀ or Y₁₃ is a halogen atom. In this step, an appropriate solvent may be used. 45 The solvent used is not limited to those described in the above document, and any solvent which does not significantly inhibit the progress of reaction can be used as the solvent. Examples of the solvent include aromatic hydrocarbons such as benzene, toluene, and xylene; halogenated hydrocarbons such as dichloromethane, chloroform, and carbon tetrachloride; chained or cyclic ethers such as diethyl ether, dioxane, tetrahydrofuran, and 1,2-dimethoxyethane; esters such as ethyl acetate and butyl acetate; ketones such as acetone, methyl isobutyl ketone, and cyclohexanone; amides such as dimethylformamide and dimethylacetamide; nitriles such as acetonitrile; and inert solvents such as 1,3-dimethyl-2-imidazolidinone and hexamethylphosphoric triamide. These solvents can be used alone or in a mixture of two or more kinds. In particular, a polar solvent is preferred. The reaction temperature may be appropriately determined in the range of -20°C to the reflux temperature of the solvent used, and the reaction time may be appropriately determined in the range of several minutes to 96 hours.

50 55 10-(iii) Formula (38) → Formula (39)

[0058] A compound represented by formula (39) can be produced by using an appropriate oxidizing agent according



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[0067] A compound represented by formula (9) can be produced by using an appropriate perfluorinated aldehyde or perfluorinated ketone according to the technique described in, for example, J. Am. Chem. Soc., p. 2410 (1965) and J. Org. Chem., p. 1001 (1965). Examples of the perfluorinated aldehyde or perfluorinated ketone include hexafluoroacetone and perfluoro-2-butanone. In this step, an appropriate solvent can be used. The solvent used in this step is not limited to those disclosed in the above documents, and any solvent which does not significantly inhibit the progress of reaction may be used. The solvents can be used alone or in a mixture of one or more kinds. The reaction temperature may be appropriately determined in the range of -20°C to 200°C, and the reaction time may be appropriately determined in the range of several minutes to 96 hours.

15

20 [0068] The compounds represented by formula (1), (3), and (4) can be produced from an aniline derivative represented by formula (9) according to any one properly selected from Production Methods 1 to 9.

[0069] In all the production Methods, the compounds may be isolated from the reaction systems after reactions according to a normal technique. However, the compounds can be optionally purified by an operation such as recrystallization, column chromatography, distillation, or the like. Alternatively, the compounds may be used in next reaction steps without being isolated from the reaction systems.

25 [0070] Although typical examples of the compounds represented by formula (1) and used as active ingredients of insecticides of the present invention are shown in Tables 1 to 5, the present invention is not limited to these examples.

[0071] Although typical examples of the compounds represented by formula (4) are shown in Tables 6 to 8, the present invention is not limited to these examples.

30 [0072] In the tables, "n-" denotes normal, "Me" denotes a methyl group, "Et" denotes an ethyl group; "n-Pr" denotes a normal propyl group, "i-Pr" denotes an isopropyl group, "n-Bu" denotes a normal butyl group, "i-Bu" denotes an isobutyl group, "s-Bu" denotes a secondary butyl group, "t-Bu" denotes a tertiary butyl group, "H" denotes a hydrogen atom, "O" denotes an oxygen atom, "S" denotes a sulfur atom, "C" denotes a carbon atom, "N" denotes a nitrogen atom, "F" denotes a fluorine atom, "Cl" denotes a chlorine atom, "Br" denotes a bromine atom, "I" denotes an iodine atom, "CF₃" denotes a trifluoromethyl group, "MeO" denotes a methoxy group, "NH₂" denotes an amino group, "MeNH" denotes a methylamino group, and "Me₂N" denotes a dimethylamino group.

Table 1(1)

40

45

(1-A)

Compound No.	R ₁	Q
1	Me	2-methyl-4-heptafluoroisopropylphenyl
2	Et	2-methyl-4-heptafluoroisopropylphenyl
3	i-Pr	2-methyl-4-heptafluoroisopropylphenyl
4	n-Bu	2-methyl-4-heptafluoroisopropylphenyl
5	i-Bu	2-methyl-4-heptafluoroisopropylphenyl
6	s-Bu	2-methyl-4-heptafluoroisopropylphenyl

Table 1(2)

Compound No.	R ₁	Q
31	2-(ethylsulfonyl)ethyl	2-methyl-4-heptafluoroisopropylphenyl
32	2-fluoroethyl	2-methyl-4-heptafluoroisopropylphenyl
33	2,2-difluoroethyl	2-methyl-4-heptafluoroisopropylphenyl
34	2,2,2-trifluoroethyl	2-methyl-4-heptafluoroisopropylphenyl
35	1,3-difluoro-2-propyl	2-methyl-4-heptafluoroisopropylphenyl
36	1-chloro-3-fluoro-2-propyl	2-methyl-4-heptafluoroisopropylphenyl
37	1-methyl-2,2,2-trifluoro-2-propyl	2-methyl-4-heptafluoroisopropylphenyl
38	3,3,3-trifluoro-n-propyl	2-methyl-4-heptafluoroisopropylphenyl
39	3,3,4,4-pentafluoro-2-butyl	2-methyl-4-heptafluoroisopropylphenyl
40	4,4,4-trifluoro-n-butyl	2-methyl-4-heptafluoroisopropylphenyl
41	2,2,3,3-tetrafluorocyclobutyl	2-methyl-4-heptafluoroisopropylphenyl
42	2,2-dichloroethyl	2-methyl-4-heptafluoroisopropylphenyl
43	1,3-dichloro-2-propyl	2-methyl-4-heptafluoroisopropylphenyl
44	3-chloro-n-propyl	2-methyl-4-heptafluoroisopropylphenyl
45	3,3,3-trichloro-n-propyl	2-methyl-4-heptafluoroisopropylphenyl
46	2-bromoethyl	2-methyl-4-heptafluoroisopropylphenyl
47	2,2,2-tribromoethyl	2-methyl-9-heptafluoroisopropylphenyl
48	2-iodoethyl	2-methyl-4-heptafluoroisopropylphenyl
49	tetrahydrofuran-3-yl	2-methyl-4-heptafluoroisopropylphenyl
50	(furan-2-yl)methyl	2-methyl-4-heptafluoroisopropylphenyl
51	(furan-3-yl)methyl	2-methyl-4-heptafluoroisopropylphenyl
52	(tetrahydrofuran-2-yl)methyl	2-methyl-4-heptafluoroisopropylphenyl
53	(tetrahydrofuran-3-yl)methyl	2-methyl-4-heptafluoroisopropylphenyl
54	(thiophen-2-yl)methyl	2-methyl-4-heptafluoroisopropylphenyl
55	(thiophen-3-yl)methyl	2-methyl-4-heptafluoroisopropylphenyl
56	(pyridin-2-yl)methyl	2-methyl-4-heptafluoroisopropylphenyl
57	(pyridin-3-yl)methyl	2-methyl-4-heptafluoroisopropylphenyl
58	(6-chloropyridin-3-yl)methyl	2-methyl-4-heptafluoroisopropylphenyl
59	Me	2,6-dimethyl-4-heptafluoroisopropylphenyl
60	Et	2,6-dimethyl-4-heptafluoroisopropylphenyl

50

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Table 1(4)

Compound No.	R ₁	Q
91	4-chlorobenzyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
92	4-nitrobenzyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
93	4-methoxycarbonylbenzyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
94	2-hydroxyethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
95	2-methoxyethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
96	2-ethoxyethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
97	2-isopropyloxyethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
98	2-benzyloxyethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
99	3-ethoxy-n-propyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
100	ethoxycarbonylmethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
101	1-(methoxycarbonyl)ethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
102	1-(ethoxycarbonyl)ethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
103	3-oxo-n-butyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
104	2-acetoxyethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
105	cyanomethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
106	2-cyanoethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
107	3-cyano-n-propyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
108	2-(methylthio)ethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
109	2-(ethylthio)ethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
110	2-(isopropylthio)ethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
111	1-methyl-2-(methylthio)ethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
112	2-(ethylsulfinyl)ethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
113	2-(ethylsulfonyl)ethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
114	3-(methylthio)-n-propyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
115	3-(ethylthio)-n-propyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
116	2-fluoroethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
117	2,2-difluoroethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
118	2,2,2-trifluoroethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
119	1,3-difluoro-2-propyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
120	1-chloro-3-fluoro-2-propyl	2,6-dimethyl-4-heptafluoroisopropylphenyl

50

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Table 1(6)

Compound No.	R ₁	Q
5	151	pyridine-3-yl
	152	pyridine-4-yl
10	153	tetrahydrofuran-2-yl
	154	tetrahydrofuran-3-yl
	155	(furan-2-yl)methyl
	156	(furan-3-yl)methyl
15	157	(tetrahydrofuran-2-yl)methyl
	158	(tetrahydrofuran-3-yl)methyl
	159	(thiophen-2-yl)methyl
	160	(thiophen-3-yl)methyl
20	161	(pyridin-2-yl)methyl
	162	(pyridin-3-yl)methyl
	163	(6-chloropyridin-3-yl)methyl
25	164	Me
	165	Et
	166	i-Pr
	167	i-Pr
30	168	i-Pr
	169	i-Pr
	170	i-Pr
35	171	i-Pr
	172	i-Pr
	173	i-Pr
	174	i-Pr
40	175	i-Pr
	176	i-Pr
	177	i-Pr
45	178	i-Pr
	179	i-Pr
	180	i-Pr

50

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Table 1(8)

Compound No.	R ₁	Q
211	2,2,2-trichloroethyl	2-chloro-5-methoxy-4-heptafluoro isopropylphenyl
212	2,2,2-trichloroethyl	2-bromo-6-methylthio-4-heptafluoro isopropylphenyl
213	2,2,2-trichloroethyl	2,6-dichloro-4-heptafluoroisopropylphenyl
214	2,2,2-trichloroethyl	2,3-dimethyl-6-chloro-4-heptafluoro isopropylphenyl
215	2,2,2-trichloroethyl	2-chloro-3,6-dimethyl-4-heptafluoro isopropylphenyl
216	2,2,2-trichloroethyl	2-methyl-3-chloromethyl-6-chloro-4-heptafluoro isopropylphenyl
217	2,2,2-trichloroethyl	2-methyl-3,6-dichloro-4-heptafluoro isopropylphenyl
218	2,2,2-trichloroethyl	2-methyl-3-bromo-6-chloro-4-heptafluoro isopropylphenyl
219	2,2,2-trichloroethyl	2-methyl-3-iodo-6-chloro-4-heptafluoro isopropylphenyl
220	2,2,2-trichloroethyl	2-methyl-3-amino-6-chloro-4-heptafluoro isopropylphenyl
221	3,3,3-trifluoro-n-propyl	2-bromo-6-n-butyl-4-heptafluoro isopropylphenyl
222	i-Pr	2-chloro-6-methyl-4-trifluoromethylphenyl
223	i-Pr	2,6-dichloro-4-trifluoromethylphenyl
224	i-Pr	2-bromo-4,6-bis(trifluoromethyl)phenyl
225	i-Pr	2,6-dimethyl-4-heptafluoro-n-propylphenyl
226	i-Pr	2,6-dimethyl-4-nonafluoro-n-butylphenyl
227	2,2,2-trichloroethyl	4-trifluoromethylphenyl
228	2,2,2-trichloroethyl	2-chloro-6-methyl-4-trifluoromethylphenyl
229	2,2,2-trichloroethyl	2-bromo-6-chloro-4-trifluoromethylphenyl
230	2,2,2-trichloroethyl	2,6-dichloro-4-trifluoromethylphenyl
231	2,2,2-trichloroethyl	2-chloro-4,6-bistrifluoromethylphenyl
232	2,2,2-trichloroethyl	2-bromo-4,6-bistrifluoromethylphenyl
233	2,2,2-trichloroethyl	2,6-dimethyl-4-heptafluoro-n-propylphenyl
234	2,2,2-trichloroethyl	2,6-dimethyl-4-nonafluoro-n-butylphenyl
235	2,2,2-trichloroethyl	2,3,5,6-tetrafluoro-4-trifluoromethylphenyl
236	2,2,2-trichloroethyl	2,6-dibromo-4-pentafluoroethylphenyl
237	3,3,3-trifluoro-n-propyl	2,6-dibromo-4-pentafluoroethylphenyl
238	3,3,3-trifluoro-n-propyl	2-bromo-6-chloro-4-trifluoromethylphenyl
239	Et	2,4-bis(trifluoromethyl)phenyl
240	i-Pr	2,4-bis(trifluoromethyl)phenyl

Table 1(9)

Compound No.	R ₁	Q
241	vinyl	2,4-bis(trifluoromethyl)phenyl
242	cyclopentyl	2,4-bis(trifluoromethyl)phenyl
243	2-chloroethyl	2,4-bis(trifluoromethyl)phenyl
244	2-cyanoethyl	2,4-bis(trifluoromethyl)phenyl
245	2,2-difluoroethyl	2,4-bis(trifluoromethyl)phenyl
246	2,2-dichloroethyl	2,4-bis(trifluoromethyl)phenyl

Table continued

	Compound No.	R ₁	Q
5	282	2-chloroethyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	283	2,2-dichloroethyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	284	1,3-dichloro-2-propyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
10	285	3-chloro-n-propyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	286	2-bromoethyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	287	2,2,2-tribromoethyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
15	288	3-bromo-n-propyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	289	2-iodoethyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	290	tetrahydrofuran-3-yl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
20	291	(furan-2-yl)methyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	292	(furan-3-yl)methyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	293	(tetrahydrofuran-2-yl)methyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
25	294	(tetrahydrofuran-3-yl)methyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	295	(thiophen-2-yl)methyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	296	(thiophen-3-yl)methyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
30	297	(pyridin-2-yl)methyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	298	(pyridin-3-yl)methyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	299	(6-chloropyridin-3-yl)methyl	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	300	2,2,2-trichloroethyl	2,6-dichloro-4-(trifluoromethylthio)phenyl

Table 1(11)

	Compound No.	R ₁	Q
35	301	2,2,2-trichloroethyl	2,6-dichloro-4-(trifluoromethylsulfonyl)phenyl
	302	Et	2,6-dimethyl-4-pentafluoroethylphenyl
	303	i-Pr	2,6-dimethyl-4-pentafluoroethylphenyl
40	304	propargyl	2,6-dimethyl-4-pentafluoroethylphenyl
	305	cyclobutyl	2,6-dimethyl-4-pentafluoroethylphenyl
	306	cyclopentyl	2,6-dimethyl-4-pentafluoroethylphenyl
45	307	benzyl	2,6-dimethyl-4-pentafluoroethylphenyl
	308	3-cyanobenzyl	2,6-dimethyl-4-pentafluoroethylphenyl
	309	4-cyanobenzyl	2,6-dimethyl-4-pentafluoroethylphenyl
50	310	3-chlorobenzyl	2,6-dimethyl-4-pentafluoroethylphenyl
	311	2-methoxyethyl	2,6-dimethyl-4-pentafluoroethylphenyl
	312	2-cyanoethyl	2,6-dimethyl-4-pentafluoroethylphenyl
55	313	2-(methylthio)ethyl	2,6-dimethyl-4-pentafluoroethylphenyl
	314	2-(ethylthio)ethyl	2,6-dimethyl-4-pentafluoroethylphenyl
	315	1-methyl2-(methylthio)ethyl	2,6-dimethyl-4-pentafluoroethylphenyl
	316	2-(ethylsulfinyl)ethyl	2,6-dimethyl-4-pentafluoroethylphenyl

Table continued

Compound No.	R ₁	Q
348	Me	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
349	Et	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
350	i-pr	2,6-dimethyl-9-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
351	propargyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
352	cyclobutyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
353	cyclopentyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
354	3-cyanobenzyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
355	4-cyanobenzyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
356	3-chlorobenzyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
357	2-methoxyethyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
358	2-cyanoethyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
359	2-(methylthio)ethyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
360	2-(ethylthio)ethyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl

Table 1(14)

Compound No.	R ₁	Q
361	1-methyl-2-(methylthio)ethyl	2,6-dimethyl-9-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
362	2-(ethylsulfinyl)ethyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
363	2-(ethylsulfonyl)ethyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
364	2-fluoroethyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
365	2,2-difluoroethyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
366	2,2,2-trifluoroethyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
367	1,3-difluoro-2-propyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
368	1-chloro-3-fluoro-2-propyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
369	1-methyl-2,2,2-trifluoroethyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
370	3,3,3-trifluoro-n-propyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
371	2,2,3,3,3-pentafluoro-n-propyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
372	3,3,4,4,4-pentafluoro-2-butyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl
373	4,4,4-trifluoro-n-butyl	2,6-dimethyl-4-(2-bromo-1,1,2,3,3,3-hexafluoro-isopropyl)phenyl

Table 1(16)

Compound No.	R ₁	Q
401	3-cyanobenzyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
402	4-cyanobenzyl	2,6-dichloro-9-(heptafluoro-n-propylthio)phenyl
403	3-chlorobenzyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
404	2-methoxyethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
405	2-cyanoethyl	2,6-dichloro-9-(heptafluoro-n-propylthio)phenyl
406	2-(methylthio)ethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
407	2-(ethylthio)ethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
408	1-methyl-2-(methylthio)ethyl	2,6-dichloro-9-(heptafluoro-n-propylthio)phenyl
409	2-(ethylsulfinyl)ethyl	2,6-dichloro-9-(heptafluoro-n-propylthio)phenyl
410	2-(ethylsulfonyl)ethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
411	2-fluoroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
412	2,2-difluoroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
413	2,2,2-trifluoroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
414	1,3-difluoro-2-propyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
415	1-chloro-3-fluoro-2-propyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
416	1-methyl-2,2,2-trifluoroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
417	3,3,3-trifluoro-n-propyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
418	2,2,3,3,3-pentafluoro-n-propyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
419	3,3,4,4,4-pentafluoro-2-butyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
420	4,4,4-trifluoro-n-butyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl

Table 1(17)

Compound No.	R ₁	Q
421	2,2,3,3-tetrafluorocyclobutyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
422	2-chloroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
423	2,2-dichloroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
424	2,2,2-trichloroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
425	1,3-dichloro-2-propyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
426	3-chloro-n-propyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
427	2-bromoethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
428	2,2,2-tribromoethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
429	3-bromo-n-propyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
430	2-iodoethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
431	tetrahydrofuran-3-yl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
432	(furan-2-yl)methyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
433	(furan-3-yl)methyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
434	(tetrahydrofuran-2-yl)methyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
435	(tetrahydrofuran-3-yl)methyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl

Table continued

Compound No.	R ₁	Q
5	467	4,4,4-trifluoro-n-butyl
	468	2,2,3,3-tetrafluorocyclobutyl
	469	2-chloroethyl
	470	2,2-dichloroethyl
10	471	2,2,2-trichloroethyl
	472	1,3-dichloro-2-propyl
	473	3-chloro-n-propyl
	474	2-bromoethyl
15	475	2,2,2-tribromoethyl
	476	3-bromo-n-propyl
	477	2-iodoethyl
	478	tetrahydrofuran-3-yl
20	479	(furan-2-yl)methyl
	480	(furan-3-yl)methyl

25

Table 1(20)

Compound No.	R ₁	Q
30	481	(tetrahydrofuran-2-yl)methyl
	482	(tetrahydrofuran-3-yl)methyl
	483	(thiophen-2-yl)methyl
	484	(thiophen-3-yl)methyl
35	485	(pyridin-2-yl)methyl
	486	(pyridin-3-yl)methyl
	487	(6-chloropyridin-3-yl)methyl
	488	Et
40	489	i-Pr
	490	vinyl
	491	propargyl
	492	cyclobutyl
45	493	cyclopentyl
	494	benzyl
	495	3-cyanobenzyl
	496	4-cyanobenzyl
50	497	3-chlorobenzyl
	498	2-methoxyethyl
	499	2-cyanoethyl
	500	2-(methylthio)ethyl

Table continued

Compound No.	R ₁	Q
5	535	Et
	536	i-Pr
	537	vinyl
10	538	propargyl
	539	cyclobutyl
15	540	cyclopentyl

Table 1(23)

Compound No.	R ₁	Q
20	541	benzyl
	542	3-cyanobenzyl
	543	4-cyanobenzyl
25	544	3-chlorobenzyl
	545	2-methoxyethyl
	546	2-cyanoethyl
30	547	2-(methylthio)ethyl
	548	2-(ethylthio)ethyl
	549	1-methyl-2-(methylthio)ethyl
35	550	2-(ethylsulfinyl)ethyl
	551	2-(ethylsulfonyl)ethyl
	552	2-fluoroethyl
40	553	2,2-difluoroethyl
	554	2,2,2-trifluoroethyl
	555	1,3-difluoro-2-propyl
45	556	1-chloro-3-fluoro-2-propyl
	557	1-methyl-2,2,2-trifluoroethyl
	558	3,3,3-trifluoro-n-propyl
50	559	2,2,3,3,3-pentafluoro-n-propyl
	560	3,3,4,4,4-pentafluoro-2-butyl

Table 1(24)

Compound No.	R ₁	Q
55	561	4,4,4-trifluoro-n-butyl
	562	2,2,3,3-tetrafluorocyclobutyl
	563	2-chloroethyl
50	564	2,2-dichloroethyl
	565	2,2,2-trichloroethyl

Table 1(26)

Compound No.	R ₁	Q
5	601	2,2,2-trifluoroethyl
	602	1,3-difluoro-2-propyl
10	603	1-chloro-3-fluoro-2-propyl
	604	1-methyl-2,2,2-trifluoroethyl
15	605	3,3,3-trifluoro-n-propyl
	606	2,2,3,3-pentafluoro-n-propyl
20	607	3,3,4,4,4-pentafluoro-2-butyl
	608	4,4,4-trifluoro-n-butyl
25	609	2,2,3-tetrafluorocyclobutyl
	610	2-chloroethyl
30	611	2,2-dichloroethyl
	612	2,2,2-trichloroethyl
35	613	1,3-dichloro-2-propyl
	614	3-chloro-n-propyl
40	615	2-bromoethyl
	616	2,2,2-tribromoethyl
45	617	3-bromo-n-propyl
	618	2-iodoethyl
50	619	tetrahydrofuran-3-yl
	620	(furan-2-yl)methyl

Table 1(27)

Compound No.	R ₁	Q
40	621	(furan-3-yl)methyl
	622	(tetrahydrofuran-2-yl)methyl
45	623	(tetrahydrofuran-3-yl)methyl
	624	(thiophen-2-yl)methyl
50	625	(thiophen-3-yl)methyl
	626	(pyridin-2-yl)methyl
55	627	(pyridin-3-yl)methyl
	628	(6-chloropyridin-3-yl)methyl
60	629	Et
	630	i-Pr
65	631	vinyl
	632	propargyl
70	633	cyclobutyl
	634	cyclopentyl

Table continued

Compound No.	R ₁	Q
666	tetrahydrofuran-3-yl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
667	(furan-2-yl)methyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
668	(furan-3-yl)methyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
669	(tetrahydrofuran-2-yl)methyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
670	(tetrahydrofuran-3-yl)methyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
671	(thiophen-2-yl)methyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
672	(thiophen-3-yl)methyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
673	(pyridin-2-yl)methyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
674	(pyridin-3-yl)methyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
675	(6-chloropyridin-3-yl)methyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
676	Et	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
677	i-Pr	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
678	vinyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
679	propargyl	Z,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
680	cyclobutyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl

Table 1(30)

Compound No.	R ₁	Q
681	cyclopentyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
682	benzyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
683	3-cyanobenzyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
684	4-cyanobenzyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
685	3-chlorobenzyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
686	2-methoxyethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
687	2-cyanoethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
688	2-(methylthio)ethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
689	2-(ethylthio)ethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
690	1-methyl-2-(methylthio)ethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
691	2-(ethylsulfinyl)ethyl	2,6-dibromo-9-(heptafluoro-n-propyl sulfinyl)phenyl
692	2-(ethylsulfonyl)ethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
693	2-fluoroethyl	2,6-dibromo-9-(heptafluoro-n-propyl sulfinyl)phenyl
694	2,2-difluoroethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
695	2,2,2-trifluoroethyl	2,6-dibromo-9-(heptafluoro-n-propyl sulfinyl)phenyl
696	1,3-difluoro-2-propyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
697	1-chloro-3-fluoro-2-propyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
698	1-methyl-2,2,2-trifluoroethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
699	3,3,3-trifluoro-n-propyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl
700	2,2,3,3,3-pentafluoro-n-propyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfinyl)phenyl

Table continued

Compound No.	R ₁	Q
735	2-(methylthio)ethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
736	2-(ethylthio)ethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
737	1-methyl-2-(methylthio)ethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
738	2-(ethylsulfinyl)ethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
739	2-(ethylsulfonyl)ethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
740	2-fluoroethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl

Table 1(33)

Compound No.	R ₁	Q
741	2,2-difluoroethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
742	2,2,2-trifluoroethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
743	1,3-difluoro-2-propyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
744	1-chloro-3-fluoro-2-propyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
745	1-methyl-2,2,2-trifluoroethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
746	3,3,3-trifluoro-n-propyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
747	2,2,3,3,3-pentafluoro-n-propyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
748	3,3,4,4,4-pentafluoro-2-butyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
749	4,4,4-trifluoro-n-butyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
750	2,2,3,3-tetrafluorocyclobutyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
751	2-chloroethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
752	2,2-dichloroethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
753	2,2,2-trichloroethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
754	1,3-dichloro-2-propyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
755	3-chloro-n-propyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
756	2-bromoethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
757	2,2,2-tribromoethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
758	3-bromo-n-propyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
759	2-iodoethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
760	tetrahydrofuran-3-yl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl

Table 1(34)

Compound No.	R ₁	Q
761	(furan-2-yl)methyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
762	(furan-3-yl)methyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
763	(tetrahydrofuran-2-yl)methyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
764	(tetrahydrofuran-3-yl)methyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl
765	(thiophen-2-yl)methyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfonyl)phenyl

Table 1(36)

Compound No.	R ₁	Q
5	801	1,3-dichloro-2-propyl
	802	3-chloro-n-propyl
10	803	2-bromoethyl
	804	2,2,2-tribromoethyl
15	805	3-bromo-n-propyl
	806	2-iodoethyl
20	807	tetrahydrofuran-3-yl
	808	(furan-2-yl)methyl
25	809	(furan-3-yl)methyl
	810	(tetrahydrofuran-2-yl)methyl
30	811	(tetrahydrofuran-3-yl)methyl
	812	(thiophen-2-yl)methyl
35	813	(thiophen-3-yl)methyl
	814	(pyridin-2-yl)methyl
40	815	(pyridin-3-yl)methyl
	816	(6-chloropyridin-3-yl)methyl
45	817	3,3,3-trifluoro-n-propyl
	818	3,3,3-trifluoro-n-propyl
50	819	3,3,3-trifluoro-n-propyl
	820	i-Pr
		2-methyl-4-trifluoromethoxyphenyl

Table 1(37)

Compound No.	R ₁	Q
40	821	i-Pr
	822	2-trifluoromethyl-4-isopropylphenyl
45	823	i-Pr
	824	3,5-bistrifluoromethylphenyl
50	825	i-Pr
	826	2,3,4-trifluorophenyl
55	827	i-Pr
	828	2-heptafluoroisopropyl-3,5-dimethylphenyl
60	829	i-Pr
	830	2,4-dichloro-6-methylphenyl
65	831	i-Pr
	832	2-chloro-4,6-dimethylphenyl
70	833	i-Pr
	834	2,6-dimethyl-4-chlorophenyl
75	835	i-Pr
	836	2,6-dimethyl-4-bromophenyl
80	837	i-Pr
	838	2,6-dimethyl-4-iodophenyl
85	839	i-Pr
	840	2,6-dimethyl-4-(phenyl)phenyl
90	841	i-Pr
	842	2,6-dimethyl-4-(2-methylphenyl)phenyl
95	843	i-Pr
	844	2,6-dimethyl-4-(3-methylphenyl)phenyl
100	845	i-Pr
	846	2,6-dimethyl-4-(4-methylphenyl)phenyl
105	847	i-Pr
	848	2,6-dimethyl-4-(2-methoxyphenyl)phenyl

Table continued

	Compound No.	R ₁	Q
5	866	2,2,2-trichloroethyl	2-chloro-6-trifluoromethylphenyl
10	867	2,2,2-trichloroethyl	2-trifluoromethyl-4-iodophenyl
15	868	2,2,2-trichloroethyl	2-trifluoromethoxy-4-bromophenyl
20	869	2,2,2-trichloroethyl	2,3,4-trifluorophenyl
25	870	2,2,2-trichloroethyl	2-heptafluoroisopropyl-3,5-dimethylphenyl
	871	2,2,2-trichloroethyl	2,5-dimethyl-4-trifluoromethane sulfonyloxyphenyl
	872	2,2,2-trichloroethyl	2,6-dimethyl-4-(bis(trifluoromethyl) hydroxymethyl)phenyl
	873	2,2,2-trichloroethyl	2,6-dimethyl-4-(bis(chlorodifluoromethyl) hydroxymethyl)phenyl
	874	2,2,2-trichloroethyl	2,6-dimethyl-4-cyanothiophenyl
	875	2,2,2-trichloroethyl	2,6-dimethyl-4-chlorophenyl
	876	2,2,2-trichloroethyl	2-chloro-4,6-dimethylphenyl
	877	2,2,2-trichloroethyl	2,6-dimethyl-4-bromophenyl
	878	2,2,2-trichloroethyl	2,6-dimethyl-4-iodophenyl
	879	2,2,2-trichloroethyl	2,6-dimethyl-4-(phenyl)phenyl
	880	2,2,2-trichloroethyl	2,6-dimethyl-4-(2-methylphenyl)phenyl

Table 1(40)

	Compound No.	R ₁	Q
30	881	2,2,2-trichloroethyl	2,6-dimethyl-4-(3-methylphenyl)phenyl
35	882	2,2,2-trichloroethyl	2,6-dimethyl-4-(4-methylphenyl)phenyl
40	883	2,2,2-trichloroethyl	2,6-dimethyl-4-(2-methoxyphenyl)phenyl
45	884	2,2,2-trichloroethyl	2,6-dimethyl-4-(3-methoxyphenyl)phenyl
50	885	2,2,2-trichloroethyl	2,6-dimethyl-4-(4-methoxyphenyl)phenyl
55	886	2,2,2-trichloroethyl	2,6-dimethyl-4-(4-ethoxyphenyl)phenyl
	887	2,2,2-trichloroethyl	2,6-dimethyl-4-(4-methylthiophenyl)phenyl
	888	2,2,2-trichloroethyl	2,6-dimethyl-4-(2-fluorophenyl)phenyl
	889	2,2,2-trichloroethyl	2,6-dimethyl-4-(3-fluorophenyl)phenyl
	890	2,2,2-trichloroethyl	2,6-dimethyl-4-(4-fluorophenyl)phenyl
	891	2,2,2-trichloroethyl	2,6-dimethyl-4-(3,4-difluorophenyl)phenyl
	892	2,2,2-trichloroethyl	2,6-dimethyl-4-(3-methyl-4-fluorophenyl)phenyl
	893	2,2,2-trichloroethyl	2,6-dimethyl-4-(furan-3-yl)phenyl
	894	2,2,2-trichloroethyl	2,6-dimethyl-4-(thiophene-2-yl)phenyl
	895	2,2,2-trichloroethyl	2,6-dimethyl-4-(thiophene-3-yl)phenyl
	896	2,2,2-trichloroethyl	2,4-dichloro-6-methylphenyl
	897	2,2,2-trichloroethyl	2,4-dichloro-6-trifluoromethylphenyl
	898	2,2,2-trichloroethyl	2,6-dichloro-4-(heptafluoroisopropylthio)phenyl
	899	2,2,2-trichloroethyl	2,6-dichloro-4-(heptafluoroisopropyl sulfonyl)phenyl
	900	2,2,2-trichloroethyl	2,6-dichloro-4-pentafluorosulfanylphenyl

Table continued

	Compound No.	R ₁	Q
5	935	2,2,2-trichloroethyl	2-chloro-4-heptafluoroisopropyl 5,6,7,8-tetrahydro-1-naphthyl
10	936	2,2,2-trichloroethyl	1-methyl-3-trifluoromethylpyrazol-5-yl
	937	2,2,2-trichloroethyl	1-methyl-3-trifluoromethyl-4-chloropyrazol-5-yl
	938	2,2,2-trichloroethyl	1-methyl-3-trifluoromethyl-4-bromopyrazol-5-yl
	939	2,2,2-trichloroethyl	1-methyl-3-trifluoromethyl-4-methoxy carbonylpyrazol-5-yl
	940	2,2,2-trichloroethyl	1-(3-chloropyridine-2-yl)-3-bromopyrazol-5-yl

Table 1(43)

	Compound No.	R ₁	Q
15	941	2,2,2-trichloroethyl	1-(3-chloropyridin-2-yl)-3-bromo -4-chloropyrazol-5-yl
20	942	2,2,2-trichloroethyl	2-heptafluoroisopropyl-4-methylpyridin-5-yl
	943	2,2,2-trichloroethyl	2-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-5-yl
	944	2,2,2-trichloroethyl	2-(1,1,1,3,3-hexafluoroisopropoxy) -4-methylpyridin-5-yl
	945	2,2,2-trichloroethyl	2-chloro-4-methylpyridin-5-yl
25	946	2,2,2-trichloroethyl	3-chloro-5-trifluoromethylpyridin-2-yl
	947	2,2,2-trichloroethyl	2-bromo-4-methyl-6-chloropyridin-3-yl
	948	2,2,2-trichloroethyl	2-bromo-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
	949	2,2,2-trichloroethyl	2,6-dichloro-4-(trifluoromethylsulfinyl)phenyl
30	950	2,2,2-trichloroethyl	2,6-dibromo-4-(trifluoromethylsulfinyl)phenyl
	951	2,2,2-trichloroethyl	2,6-dichloro-4-(pentafluoroethylsulfinyl)phenyl
	952	2,2,2-trichloroethyl	2,6-dibromo-4-(pentafluoroethylsulfinyl)phenyl
	953	2,2,2-trichloroethyl	2,6-dichloro-4-(pentafluoroethylsulfonyl)phenyl
	954	2,2,2-trichloroethyl	2,6-dibromo-4-(pentafluoroethylsulfonyl)phenyl
35	955	2,2,2-trichloroethyl	2,6-dichloro-4-(heptafluoro-n-propyl sulfanyl)phenyl
	956	2,2,2-trichloroethyl	2,6-dibromo-4-(heptafluoro-n-propyl sulfanyl)phenyl
	957	2,2,2-trichloroethyl	2-chloro-6-methyl-4-(nonafluoro-2-butyl)phenyl
	958	2,2,2-trichloroethyl	2-bromo-6-methyl-4-(nonafluoro-2-butyl)phenyl
	959	2,2,2-trichloroethyl	2-iodo-6-methyl-4-(nonafluoro-2-butyl)phenyl
40	960	2,2,2-trichloroethyl	2,6-dichloro-4-(nonafluoro-2-butyl)phenyl
45			

Table 1(44)

	Compound No.	R ₁	Q
50	961	2,2,2-trichloroethyl	2,6-dibromo-4-(nonafluoro-2-butyl)phenyl
55	962	2,2,2-trichloroethyl	2,6-dimethyl-4-pentafluoroethylphenyl
	963	2,2,2-trichloroethyl	2,6-dichloro-4-pentafluoroethylphenyl
	964	2,2,2-trichloroethyl	2,6-dimethyl-4-(pentafluoroethylthio) phenyl
	965	2,2,2-trichloroethyl	2,6-dimethyl-4-(pentafluoroethylsulfinyl) phenyl

Table continued

Compound No.	R ₁	Q
987	3,3,4,4,4-pentafluoro-2-butyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
988	4,4,4-trifluoro-n-butyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
989	2,2,3,3-tetrafluorocyclobutyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
990	2-chloroethyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
991	2,2-dichloroethyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
992	2,2,2-trichloroethyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
993	1,3-dichloro-2-propyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
994	3-chloro-n-propyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
995	2-bromoethyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
996	2,2,2-tribromoethyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
997	3-bromo-n-propyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
998	2-iodoethyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
999	tetrahydrofuran-3-yl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
1000	(furan-2-yl)methyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl

Table 1(46)

Compound No.	R ₁	Q
1001	(furan-3-yl)methyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
1002	(tetrahydrofuran-2-yl)methyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
1003	(tetrahydrofuran-3-yl)methyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
1004	(thiophen-2-yl)methyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
1005	(thiophen-3-yl)methyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl
1006	(pyridin-2-yl)methyl	2-chloro-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy) pyridin-3-yl

Table continued

Compound No.	R ₁	Q
5 1027	2,2-difluoroethyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1028	2,2,2-trifluoroethyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
10 1029	1,3-difluoro-2-propyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
15 1030	1-chloro-3-fluoro-2-propyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1031	1-methyl-2,2,2-trifluoroethyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
20 1032	3,3,3-trifluoro-n-propyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1033	2,2,3,3,3-pentafluoro-n-propyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
25 1034	3,3,4,4,4-pentafluoro-2-butyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1035	4,4,4-trifluoro-n-butyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
30 1036	2,2,3,3-tetrafluorocyclobutyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1037	2-chloroethyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
35 1038	2,2-dichloroethyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1039	2,2,2-trichloroethyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
40 1040	1,3-dichloro-2-propyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table 1(48)

Compound No.	R ₁	Q
45 1041	3-chloro-n-propyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1042	2-bromoethyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
50 1043	2,2,2-tribromoethyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1044	3-bromo-n-propyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
55 1045	2-iodoethyl	2-bromo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table continued

Compound No.	R ₁	Q
5 1066	2-methoxyethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1067	2-cyanoethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
10 1068	2-(methylthio)ethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1069	2-(ethylthio)ethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
15 1070	1-methyl-2-(methylthio)ethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1071	2-(ethylsulfinyl)ethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
20 1072	2-(ethylsulfonyl)ethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1073	2-fluoroethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
25 1074	2,2-difluoroethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1075	2,2,2-trifluoroethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
30 1076	1,3-difluoro-2-propyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1077	1-chloro-3-fluoro-2-propyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
35 1078	1-methyl-2,2,2-trifluoroethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1079	3,3,3-trifluoro-n-propyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
40 1080	2,2,3,3,3-pentafluoro-n-propyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table 1(50)

Compound No.	R ₁	Q
45 1081	3,3,4,4,4-pentafluoro-2-butyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1082	4,4,4-trifluoro-n-butyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
50 1083	2,2,3,3-tetrafluorocyclobutyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
1084	2-chloroethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl
55 1085	2,2-dichloroethyl	2-iodo-4-methyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table continued

Compound No.	R ₁	Q
5	1109	benzyl
	1110	3-cyanobenzyl
	1111	4-cyanobenzyl
	1112	3-chlorobenzyl
10	1113	2-methoxyethyl
	1114	2-cyanoethyl
	1115	2-(methylthio)ethyl
	1116	2-(ethylthio)ethyl
15	1117	1-methyl-2-(methylthio)ethyl
	1118	2-(ethylsulfinyl)ethyl
	1119	2-(ethylsulfonyl)ethyl
	1120	2-fluoroethyl
20		2,4-dimethyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table 1(52)

Compound No.	R ₁	Q
25	1121	2,2-difluoroethyl
	1122	2,2,2-trifluoroethyl
	1123	1,3-difluoro-2-propyl
	1124	1-chloro-3-fluoro-2-propyl
30	1125	1-methyl-2,2,2-trifluoroethyl
	1126	3,3,3-trifluoro-n-propyl
	1127	2,2,3,3,3-pentafluoro-n-propyl
	1128	3,3,4,4,4-pentafluoro-2-butyl
35	1129	4,4,4-trifluoro-n-butyl
	1130	2,2,3,3-tetrafluorocyclobutyl
	1131	2-chloroethyl
	1132	2,2-dichloroethyl
40	1133	2,2,2-trichloroethyl
	1134	1,3-dichloro-2-propyl
	1135	3-chloron-propyl
	1136	2-bromoethyl
45	1137	2,2,2-tribromoethyl
	1138	3-bromo-n-propyl
	1139	2-iodoethyl
	1140	tetrahydrofuran-3-yl
50		2,4-dimethyl-6-(1,1,1,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table continued

	Compound No.	R ₁	Q
5	1176	4,4,4-trifluoro-n-butyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1177	2,2,3,3-tetrafluorocyclobutyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1178	2-chloroethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1179	2,2-dichloroethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
10	1180	2,2,2-trichloroethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl

Table 1(55)

	Compound No.	R ₁	Q
15	1181	1,3-dichloro-2-propyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1182	3-chloro-n-propyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1183	2-bromoethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1184	2,2,2-tribromoethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
20	1185	3-bromo-n-propyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1186	2-iodoethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1187	tetrahydrofuran-3-yl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1188	(furan-2-yl)methyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
25	1189	(furan-3-yl)methyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1190	(tetrahydrofuran-2-yl)methyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1191	(tetrahydrofuran-3-yl)methyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1192	(thiophen-2-yl)methyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
30	1193	(thiophen-3-yl)methyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1194	(pyridin-2-yl)methyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1195	(pyridin-3-yl)methyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
	1196	(6-chloropyridin-3-yl)methyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
35	1197	Et	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
	1198	i-Pr	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
	1199	vinyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
	1200	propargyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
40			
45			

Table 1(56)

	Compound No.	R ₁	Q
50	1201	cyclobutyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
	1202	cyclopentyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
	1203	benzyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
	1204	3-cyanobenzyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
55	1205	4-cyanobenzyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
	1206	3-chlorobenzyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl

Table 1(58)

Compound No.	R ₁	Q
5	1241	(pyridin-2-yl)methyl
	1242	(pyridin-3-yl)methyl
10	1243	(6-chloropyridin-3-yl)methyl
	1244	Et
15	1245	i-Pr
	1246	vinyl
20	1247	propargyl
	1248	cyclobutyl
25	1249	cyclopentyl
	1250	benzyl
30	1251	3-cyanobenzyl
	1252	4-cyanobenzyl
35	1253	3-chlorobenzyl
	1254	2-methoxyethyl
40	1255	2-cyanoethyl
	1256	2-(methylthio)ethyl
45	1257	2-(ethylthio)ethyl
	1258	1-methyl-2-(methylthio)ethyl
50	1259	2-(ethylsulfinyl)ethyl
	1260	2-(ethylsulfonyl)ethyl

Table 1(59)

Compound No.	R ₁	Q
40	1261	2-fluoroethyl
	1262	2,2-difluoroethyl
45	1263	2,2,2-trifluoroethyl
	1264	1,3-difluoro-2-propyl
50	1265	1-chloro-3-fluoro-2-propyl
	1266	1-methyl-2,2,2-trifluoroethyl
55	1267	3,3,3-trifluoro-n-propyl
	1268	2,2,3,3-pentafluoro-n-propyl
	1269	3,3,4,4,4-pentafluoro-2-butyl
	1270	4,4,4-trifluoro-n-butyl
	1271	2,2,3,3-tetrafluorocyclobutyl
	1272	2-chloroethyl
	1273	2,2-dichloroethyl
	1274	2,2,2-trichloroethyl

Table continued

Compound No.	R ₁	Q
5	1306	2-(ethylsulfinyl)ethyl
	1307	2-(ethylsulfonyl)ethyl
	1308	2-fluoroethyl
	1309	2,2-difluoroethyl
	1310	2,2,2-trifluoroethyl
10	1311	1,3-difluoro-2-propyl
	1312	1-chloro-3-fluoro-2-propyl
	1313	1-methyl-2,2,2-trifluoroethyl
	1314	3,3,3-trifluoro-n-propyl
	1315	2,2,3,3-pentafluoro-n-propyl
15	1316	3,3,4,4,4-pentafluoro-2-butyl
	1317	4,4,4-trifluoro-n-butyl
	1318	2,2,3,3-tetrafluorocyclobutyl
	1319	2-chloroethyl
	1320	2,2-dichloroethyl
20		2-iodo-6-methyl-4-heptafluoroisopropylphenyl
		2-iodo-6-methyl-4-heptafluoroisopropylphenyl
25		2-iodo-6-methyl-4-heptafluoroisopropylphenyl
		2-iodo-6-methyl-4-heptafluoroisopropylphenyl

Table 1(62)

Compound No.	R ₁	Q
30	1321	2,2,2-trichloroethyl
	1322	1,3-dichloro-2-propyl
	1323	3-chloro-n-propyl
	1324	2-bromoethyl
	1325	2,2,2-tribromoethyl
35	1326	3-bromo-n-propyl
	1327	2-idoethyl
	1328	tetrahydrofuran-3-yl
	1329	(furan-2-yl)methyl
	1330	(furan-3-yl)methyl
40	1331	(tetrahydrofuran-2-yl)methyl
	1332	(tetrahydrofuran-3-yl)methyl
	1333	(thiophen-2-yl)methyl
	1334	(thiophen-3-yl)methyl
	1335	(pyridin-2-yl)methyl
45	1336	(pyridin-3-yl)methyl
	1337	(6-chloropyridin-3-yl)methyl
	1338	Et
	1339	i-Pr
	1340	vinyl
50		2-iodo-6-n-propyl-4-heptafluoroisopropylphenyl
		2-iodo-6-n-propyl-4-heptafluoroisopropylphenyl
55		2-iodo-6-n-propyl-4-heptafluoroisopropylphenyl
		2-iodo-6-n-propyl-4-heptafluoroisopropylphenyl

Table continued

Compound No.	R ₁	Q
1375	tetrahydrofuran-3-yl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1376	(furan-2-yl)methyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1377	(furan-3-yl)methyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1378	(tetrahydrofuran-2-yl)methyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1379	(tetrahydrofuran-3-yl)methyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1380	(thiophen-2-yl)methyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl

Table 1(65)

Compound No.	R ₁	Q
1381	(thiophen-3-yl)methyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1382	(pyridin-2-yl)methyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1383	(pyridin-3-yl)methyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1384	(6-chloropyridin-3-yl)methyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl

Table 2(1)

(1-B)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1385	Me	H	H	H	2,2,2-trichloroethyl	2-methyl-4-heptafluoroisopropyl phenyl
1386	Me	H	H	H	i-pr	2,6-dimethyl-4-heptafluoroisopropyl phenyl
1387	Me	H	H	H	2,2,2-trichloroethyl	2,6-dimethyl-4-heptafluoroisopropyl phenyl
1388	F	H	H	H	Et	2,6-dimethyl-4-heptafluoroisopropyl phenyl
1389	F	H	H	H	i-Pr	2,6-dimethyl-4-heptafluoroisopropyl phenyl
1390	F	H	H	H	vinyl	2,6-dimethyl-4-heptafluoroisopropyl phenyl
1391	F	H	H	H	propargyl	2,6-dimethyl-4-heptafluoroisopropyl phenyl
1392	F	H	H	H	cyclobutyl	2,6-dimethyl-4-heptafluoroisopropyl phenyl
1393	F	H	H	H	cyclopentyl	2,6-dimethyl-4-heptafluoroisopropyl phenyl

Table continued

	Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
5	1410	F	H	H	H	1-methyl-2,2,2-trifluoro ethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1411	F	H	H	H	3,3,3-trifluoro-n-propyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
10	1412	F	H	H	H	2,2,3,3,3-pentafluoro-n-propyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1413	F	H	H	H	3,3,4,4,4-pentafluoro-2-butyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
15	1414	F	H	H	H	4,4,4-trifluoro-n-butyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1415	F	H	H	H	2,2,3,3-tetrafluoro cyclobutyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
20	1416	F	H	H	H	2-chloroethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1417	F	H	H	H	2,2-dichloroethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
25	1418	F	H	H	H	2,2,2-trichloroethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1419	F	H	H	H	1,3-dichloro-2-propyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
30	1420	F	H	H	H	3-chloro-n-propyl	2,6-dimethyl-4-heptafluoroisopropylphenyl

Table 2(3)

	Compound-No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
35	1421	F	H	H	H	2-bromoethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1422	F	H	H	H	2,2,2-tribromoethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
40	1423	F	H	H	H	3-bromo-n-propyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1424	F	H	H	H	2-idoethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
45	1425	F	H	H	H	tetrahydrofuran-3-yl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1426	F	H	H	H	(furan-2-yl)methyl	2,6-dimethyl-9-heptafluoroisopropylphenyl
50	1427	F	H	H	H	(furan-3-yl)methyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1428	F	H	H	H	(tetrahydrofuran-2-yl)methyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
55	1429	F	H	H	H	(tetrahydrofuran-3-yl)methyl	2,6-dimethyl-4-heptafluoroisopropylphenyl

Table continued

	1450	F	H	H	H	2-(ethylsulfinyl)ethyl	2,6-dimethyl-4-(nonafluoro2-butyl) phenyl
5	1451	F	H	H	H	2-(ethylsulfonyl)ethyl	2,6-dimethyl-4-(nonafluoro2-butyl) phenyl
10	1452	F	H	H	H	2-fluoroethyl	2,6-dimethyl-4-(nonafluoro2-butyl) phenyl
15	1453	F	H	H	H	2,2-difluoroethyl	2,6-dimethyl-4-(nonafluoro2-butyl) phenyl
20	1454	F	H	H	H	2,2,2-trifluoroethyl	2,6-dimethyl-4-(nonafluoro2-butyl) phenyl
25	1455	F	H	H	H	1,3-difluoro-2-propyl	2,6-dimethyl-4-(nonafluoro2-butyl) phenyl
30	1456	F	H	H	H	1-chloro-3-fluoro-2-propyl	2,6-dimethyl-4-(nonafluoro2-butyl) phenyl
35	1457	F	H	H	H	1-methyl-2,2,2-trifluoro ethyl	2,6-dimethyl-4-(nonafluoro2-butyl) phenyl
40	1958	F	H	H	H	3,3,3-trifluoro-n-propyl	2,6-dimethyl-4-(nonafluoro2-butyl) phenyl
45	1459	F	H	H	H	2,2,3,3,3-pentafluoro-n-propyl	2,6-dimethyl-4-(nonafluoro2-butyl) phenyl
50	1460	F	H	H	H	3,3,4,4,4-pentafluoro-2-butyl	2,6-dimethyl-4-(nonafluoro2-butyl) phenyl

Table 2(5)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q	
35	1385	Me	H	H	H	2,2,2-trichloroethyl	2-methyl-4-heptafluoroisopropylphenyl
40	1386	Me	H	H	H	i-Pr	2,6-dimethyl-4-heptafluoroisopropylphenyl
45	1387	Me	H	H	H	2,2,2-trichloroethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
50	1388	F	H	H	H	Et	2,6-dimethyl-4-heptafluoroisopropylphenyl
55	1389	F	H	H	H	i-Pr	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1390	F	H	H	H	vinyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1391	F	H	H	H	propargyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1392	F	H	H	H	cyclobutyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1393	F	H	H	H	cyclopentyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
	1394	F	H	H	H	benzyl	2,6-dimethyl-4-heptafluoroisopropylphenyl

Table continued

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
5 1491	F	H	H	H	2-(ethylthio)ethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
10 1492	F	H	H	H	1-methyl-2-(methylthio) ethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
15 1493	F	H	H	H	2-(ethylsulfinyl)ethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
20 1494	F	H	H	H	2-fluoroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
25 1495	F	H	H	H	2,2-difluoroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
30 1496	F	H	H	H	2,2,2-trifluoroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
35 1497	F	H	H	H	1,3-difluoro-2-propyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
40 1498	F	H	H	H	1-chloro-3-fluoro-2-propyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
45 1499	F	H	H	H	1-methyl-2,2,2-trifluoroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
50 1500	F	H	H	H	3,3,3-trifluoro-n-propyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl

Table 2 (7)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
35 1501	F	H	H	H	2,2,3,3,3-pentafluoro-n-propyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
40 1502	F	H	H	H	4,4,4-trifluoro-n-butyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
45 1503	F	H	H	H	2,2,3,3-tetrafluorocyclo butyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
50 1504	F	H	H	H	2-chloroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
55 1505	F	H	H	H	2,2-dichloroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
50 1506	F	H	H	H	2,2,2-trichloroethyl	2,6-dichloro-4-(heptafluoro-n-propylthio)phenyl
55 1507	F	H	H	H	1,3-dichloro-2-propyl	2,6-dichloro-9-(heptafluoro-n-propylthio)phenyl
55 1508	F	H	H	H	3-chloro-n-propyl	2,6-dichloro-9-(heptafluoro-n-propylthio)phenyl
55 1509	F	H	H	H	2-bromoethyl	2,6-dichloro-9-(heptafluoro-n-propylthio)phenyl
55 1510	F	H	H	H	3-bromo-n-propyl	2,6-dichloro-9-(heptafluoro-n-propylthio)phenyl

Table continued

	Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
5	1531	F	H	H	H	3,3,3-trifluoro-n-propyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
	1532	F	H	H	H	2,2,3,3,3-pentafluoro-n-propyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
10	1533	F	H	H	H	4,4,4-trifluoro-n-butyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
	1534	F	H	H	H	2,2,3,3-tetrafluorocyclo butyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
15	1535	F	H	H	H	2-chloroethyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
	1536	F	H	H	H	2,2-dichloroethyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
20	1537	F	H	H	H	2,2,2-trichloroethyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
	1538	F	H	H	H	1,3-dichloro-2-propyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
25	1539	F	H	H	H	3-chloro-n-propyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
	1540	F	H	H	H	2-bromoethyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl

Table 2(9)

	Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
35	1541	F	H	H	H	3-bromo-n-propyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
	1542	F	H	H	H	2-iodoethyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
40	1543	F	H	H	H	(6-chloropyridin-3-yl)methyl	2,6-dibromo-4-(trifluoromethylsulfonyl)phenyl
	1544	F	H	H	H	Et	2,6-dibromo-4-(pentafluoroethylthio) phenyl
45	1545	F	H	H	H	i-Pr	2,6-dibromo-4-(pentafluoroethylthio) phenyl
	1546	F	H	H	H	vinyl	2,6-dibromo-4-(pentafluoroethylthio) phenyl
50	1547	F	H	H	H	cyclobutyl	2,6-dibromo-4-(pentafluoroethylthio) phenyl
	1548	F	H	H	H	cyclopentyl	2,6-dibromo-4-(pentafluoroethylthio) phenyl
55	1549	F	H	H	H	3-cyanobenzyl	2,6-dibromo-9-(pentafluoroethylthio) phenyl
	1550	F	H	H	H	4-cyanobenzyl	2,6-dibromo-4-(pentafluoroethylthio) phenyl

Table continued

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
5 1571	F	H	H	H	2-bromoethyl	2,6-dibromo-4-(pentafluoroethylthio)phenyl
10 1572	F	H	H	H	3-bromo-n-propyl	2,6-dibromo-4-(pentafluoroethylthio)phenyl
15 1573	F	H	H	H	2-iodoethyl	2,6-dibromo-4-(pentafluoroethylthio)phenyl
20 1574	F	H	H	H	(6-chloropyridin-3-yl) methyl	2,6-dibromo-4-(pentafluoroethylthio)phenyl
25 1575	F	H	H	H	Et	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
30 1576	F	H	H	H	i-Pr	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
35 1577	F	H	H	H	vinyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
40 1578	F	H	H	H	cyclobutyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
45 1579	F	H	H	H	cyclopentyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
50 1580	F	H	H	H	3-cyanobenzyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl

Table 2(11)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
35 1581	F	H	H	H	4-cyanobenzyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
40 1582	F	H	H	H	2-cyanoethyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
45 1583	F	H	H	H	2-(methylthio)ethyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
50 1584	F	H	H	H	2-(ethylthio)ethyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
55 1585	F	H	H	H	1-methyl-2-(methylthio) ethyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
55 1586	F	H	H	H	2-(ethylsulfinyl)ethyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
55 1587	F	H	H	H	2-fluoroethyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
55 1588	F	H	H	H	2,2-difluoroethyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
55 1589	F	H	H	H	2,2,2-trifluoroethyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
55 1590	F	H	H	H	1,3-difluoro-2-propyl	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl

Table continued

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
5 1610	F	H	H	H	cyclopentyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
10 1611	F	H	H	H	3-cyanobenzyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
15 1612	F	H	H	H	4-cyanobenzyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
20 1613	F	H	H	H	2-cyanoethyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
25 1614	F	H	H	H	2-(methylthio)ethyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
30 1615	F	H	H	H	2-(ethylthio)ethyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
35 1616	F	H	H	H	1-methyl-2-(methylthio) 1-methyl-2-(methylthio) ethyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
40 1617	F	H	H	H	2-(ethylsulfinyl)ethyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
1618	F	H	H	H	2-fluoroethyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
1619	F	H	H	H	2,2-difluoroethyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
1620	F	H	H	H	2,2,2-trifluoroethyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl

Table 2(13)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
45 1621	F	H	H	H	1,3-difluoro-2-propyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
50 1622	F	H	H	H	1-chloro-3-fluoro2-propyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl
1623	F	H	H	H	1-methyl-2,2,2-trifluoro ethyl	2,6-dibromo-4-(heptafluoroisopropylthio)phenyl

Table 2(14)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1641	F	H	H	H	cyclopentyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1642	F	H	H	H	3-cyanobenzyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1643	F	H	H	H	4-cyanobenzyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1644	F	H	H	H	2-cyanoethyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1645	F	H	H	H	2-(methylthio)ethyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1646	F	H	H	H	2-(ethylthio)ethyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1647	F	H	H	H	1-methyl-2-(methylthio)ethyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1648	F	H	H	H	2-(ethylsulfinyl)ethyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1649	F	H	H	H	2-fluoroethyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1650	F	H	H	H	2,2-difluoroethyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1651	F	H	H	H	2,2,2-trifluoroethyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1652	F	H	H	H	1,3-difluoro-2-propyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1653	F	H	H	H	1-chloro-3-fluoro-2-propyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1654	F	H	H	H	1-methyl-2,2,2-trifluoro ethyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1655	F	H	H	H	3,3,3-trifluoro-n-propyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1656	F	H	H	H	2,2,3,3,3-pentafluoro-n-	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1657	F	H	H	H	4,4,4-trifluoro-n-butyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1658	F	H	H	H	2,2,3,3-tetrafluorocyclo butyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1659	F	H	H	H	2-chloroethyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl
1660	F	H	H	H	2,2-dichloroethyl	2,6-dimethyl-4-(heptafluoro-n-propylthio)phenyl

Table 2(16)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1681	F	H	H	H	Et	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1682	F	H	H	H	i-pr	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1683	F	H	H	H	vinyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1684	F	H	H	H	cyclobutyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1685	F	H	H	H	cyclopentyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1686	F	H	H	H	3-cyanobenzyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1687	F	H	H	H	4-cyanobenzyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1688	F	H	H	H	2-cyanoethyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1689	F	H	H	H	2-(methylthio)ethyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1690	F	H	H	H	2-(ethylthio)ethyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1691	F	H	H	H	1-methyl-2-(methylthio) ethyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1692	F	H	H	H	2-(ethylsulfinyl)ethyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1693	F	H	H	H	2-fluoroethyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1694	F	H	H	H	2,2-difluoroethyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1695	F	H	H	H	2,2,2-trifluoroethyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1696	F	H	H	H	1,3-difluoro-2-propyl	2-chloro-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table continued

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q	
5	1716	F	H	H	H	cyclopentyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1717	F	H	H	H	3-cyanobenzyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1718	F	H	H	H	4-cyanobenzyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1719	F	H	H	H	2-cyanoethyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1720	F	H	H	H	2-(methylthio)ethyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table 2(18)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q	
20	1721	F	H	H	H	2-(ethylthio)ethyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1722	F	H	H	H	1-methyl-2-(methylthio)ethyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1723	F	H	H	H	2-(ethylsulfinyl)ethyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1724	F	H	H	H	2-fluoroethyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1725	F	H	H	H	2,2-difluoroethyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
30	1726	F	H	H	H	2,2,2-trifluoroethyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1727	F	H	H	H	1,3-difluoro-2-propyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1728	F	H	H	H	1-chloro-3-fluoro-2-propyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1729	F	H	H	H	1-methyl-2,2,2-trifluoroethyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
	1730	F	H	H	H	3,3,3-trifluoro-n-propyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
40	1731	F	H	H	H	2,2,3,3,3-pentafluoro-n-propyl	2-bromo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table continued

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
5 1746	F	H	H	H	cyclobutyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
10 1747	F	H	H	H	cyclopentyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
15 1748	F	H	H	H	3-cyanobenzyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
20 1749	F	H	H	H	4-cyanobenzyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
25 1750	F	H	H	H	2-cyanoethyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
30 1751	F	H	H	H	2-(methylthio)ethyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
35 1752	F	H	H	H	2-(ethylthio)ethyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
40 1753	F	H	H	H	1-methyl-2-(methylthio)ethyl	2-iodo-9-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
45 1754	F	H	H	H	2-(ethylsulfinyl)ethyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
50 1755	F	H	H	H	2-fluoroethyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
55 1756	F	H	H	H	2,2-difluoroethyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1757	F	H	H	H	2,2,2-trifluoroethyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1758	F	H	H	H	1,3-difluoro-2-propyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1759	F	H	H	H	1-chloro-3-fluoro-2-propyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1760	F	H	H	H	1-methyl-2,2,2-trifluoroethyl	2-iodo-4-methyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table continued

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1777	F	H	H	H	cyclobutyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1778	F	H	H	H	cyclopentyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1779	F	H	H	H	3-cyanobenzyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1780	F	H	H	H	4-cyanobenzyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table 2(21)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1781	F	H	H	H	2-cyanoethyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1782	F	H	H	H	2-(methylthio)ethyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1783	F	H	H	H	2-(ethylthio)ethyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1784	F	H	H	H	1-methyl-2-(methylthio)ethyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1785	F	H	H	H	2-(ethylsulfinyl)ethyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1786	F	H	H	H	2-fluoroethyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1787	F	H	H	H	2,2-difluoroethyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1788	F	H	H	H	2,2,2-trifluoroethyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1789	F	H	H	H	1,3-difluoro-2-propyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl
1790	F	H	H	H	1-chloro-3-fluoro-2-propyl	2,4-dimethyl-6-(1,1,1,3,3,3-hexafluoro isopropoxy)pyridin-3-yl

Table continued

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1805	F	H	H	H	Et	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1806	F	H	H	H	i-Pr	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1807	F	H	H	H	vinyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1808	F	H	H	H	cyclobutyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1809	F	H	H	H	cyclopentyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1810	F	H	H	H	3-cyanobenzyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1811	F	H	H	H	4-cyanobenzyl	2-bromo-9-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1812	F	H	H	H	2-cyanoethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1813	F	H	H	H	2-(methylthio)ethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1814	F	H	H	H	2-(ethylthio)ethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1815	F	H	H	H	1-methyl-2-(methylthio) ethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1816	F	H	H	H	2-(ethylsulfinyl)ethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1817	F	H	H	H	2-fluoroethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1818	F	H	H	H	2,2-difluoroethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1819	F	H	H	H	2,2,2-trifluoroethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1820	F	H	H	H	1,3-difluoro-2-propyl	2-bromo-9-methyl-6-(heptafluoro isopropyl)pyridin-3-yl

Table 2(23)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1821	F	H	H	H	1-chloro-3-fluoro-2-propyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1822	F	H	H	H	1-methyl-2,2,2-trifluoroethyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1823	F	H	H	H	3,3,3-trifluoro-n-propyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl
1824	F	H	H	H	2,2,3,3,3-pentafluoro-n-propyl	2-bromo-4-methyl-6-(heptafluoro isopropyl)pyridin-3-yl

Table continued

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1845	F	H	H	H	2-(ethylthio)ethyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1846	F	H	H	H	1-methyl-2-(methylthio) ethyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1847	F	H	H	H	2-(ethylsulfinyl)ethyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1848	F	H	H	H	2-fluoroethyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1849	F	H	H	H	2,2-difluoroethyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1850	F	H	H	H	2,2,2-trifluoroethyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1851	F	H	H	H	1,3-difluoro-2-propyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1852	F	H	H	H	1-chloro-3-fluoro-2-propyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1853	F	H	H	H	1-methyl-2,2,2-trifluoroethyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1854	F	H	H	H	3,3,3-trifluoro-n-propyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1855	F	H	H	H	2,2,3,3,3-pentafluoro-n-propyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1856	F	H	H	H	4,4,4-trifluoro-n-butyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1857	F	H	H	H	2,2,3,3-tetrafluoro cyclobutyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1858	F	H	H	H	2-chloroethyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1859	F	H	H	H	2,2-dichloroethyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl
1860	F	H	H	H	2,2,2-trichloroethyl	2-chloro-6-methyl-4-heptafluoroisopropyl phenyl

Table 2(25)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1861	F	H	H	H	1,3-dichloro-2-propyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
1862	F	H	H	H	3-chloro-n-propyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
1863	F	H	H	H	2-bromoethyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl
1864	F	H	H	H	3-bromo-n-propyl	2-chloro-6-methyl-4-heptafluoroisopropylphenyl

Table continued

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1885	F	H	H	H	3,3,3-trifluoro-n-propyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1886	F	H	H	H	2,2,3,3,3-pentafluoro-n-propyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1887	F	H	H	H	4,4,4-trifluoro-n-butyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1888	F	H	H	H	2,2,3,3-tetrafluoro cyclobutyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1889	F	H	H	H	2-chloroethyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1890	F	H	H	H	2,2-dichloroethyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1891	F	H	H	H	2,2,2-trichloroethyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1892	F	H	H	H	1,3-dichloro-2-propyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1893	F	H	H	H	3-chloro-n-propyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1894	F	H	H	H	2-bromoethyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1895	F	H	H	H	3-bromo-n-propyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1896	F	H	H	H	2-idoethyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1897	F	H	H	H	(6-chloropyridin-3-yl)methyl	2-iodo-6-n-propyl-4-heptafluoro isopropylphenyl
1898	Cl	H	H	H	i-Pr	2-methyl-4-heptafluoroisopropylphenyl
1899	Cl	H	H	H	2,2,2-trichloroethyl	2-methyl-4-heptafluoroisopropylphenyl
1900	Cl	H	H	H	i-Pr	2,6-dimethyl-4-heptafluoroisopropylphenyl

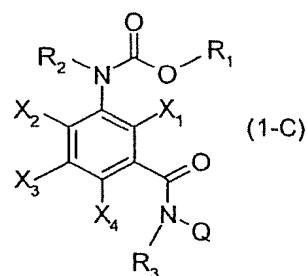
Table 2(27)

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1901	Cl	H	H	H	2,2,2-trichloroethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
1902	Cl	H	H	H	2,2,2-trichloroethyl	2,4-bistrifluoromethylphenyl
1903	Cl	H	H	H	2,2,2-trichloroethyl	2-(1,1,1,3,3-hexafluoroisopropoxy) -4-methylpyridin-5-yl
1904	Br	H	H	H	i-Pr	2,6-dimethyl-4-heptafluoroisopropylphenyl
1905	Br	H	H	H	2,2,2-trichloroethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl
1906	F	F	H	H	2,2,2-trichloroethyl	2-methyl-4-heptafluoroisopropylphenyl
1907	F	F	H	H	2,2,2-trichloroethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl

Table continued

Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	Q
1943	H	H	H	Br	2,2,2-trichloroethyl	2-methyl-4-heptafluoroisopropylphenyl
1944	H	H	H	I	2,2,2-trichloroethyl	2-methyl-4-heptafluoroisopropylphenyl
1945	H	H	H	I	i-Pr	2,6-dimethyl-4-heptafluoroisopropylphenyl
1946	H	H	H	I	t-Bu	2-methyl-4-heptafluoroisopropylphenyl
1947	H	H	H	I	2,2,2-trichloroethyl	2,6-dimethyl-4-heptafluoroisopropylphenyl

Table 3



Compound No.	X ₁	X ₂	X ₃	X ₄	R ₁	R ₂	R ₃	Q
1948	H	H	H	H	2,2,2-trichloro ethyl	Me	H	2,6-dibromo-4-(heptafluoro n-propylthio)phenyl
1949	H	H	H	H	2,2,2-trichloro ethyl	H	Me	2-methyl-4-heptafluoroisopropyl phenyl
1950	H	H	H	H	i-Pr	H	Me	2,6-dimethyl-4-heptafluoroisopropyl phenyl
1951	H	H	H	H	2,2,2-trichloro ethyl	H H	Me Me	2,6-dimethyl-4-heptafluoroisopropyl phenyl
1952	H	H	H	H	i-Pr	H	Me	2-methyl-6-chloro-4-heptafluoroisopropyl phenyl
1953	H	H	H	H	2,2,2-trichloro ethyl	H	Me	2-methyl-6-chloro-4-heptafluoroisopropyl phenyl
1954	H	H	H	H	i-Pr	H	Me	2-methyl-6-bromo-4-heptafluoroisopropyl phenyl
1955	H	H	H	H	2,2,2-trichloro ethyl	H H	Me	2-methyl-6-bromo-4-heptafluoroisopropyl phenyl
1956	H	H	H	H	2,2,2-trichloro ethyl	H	Et	2,6-dimethyl-4-heptafluoroisopropyl phenyl

Table 5(1)

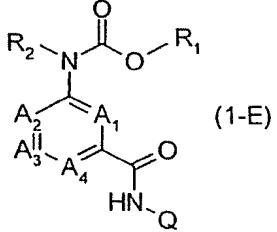
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10	Compound No.	A ₁	A ₂	A ₃	A ₄	R ₁	R ₂	Q
15	1965	N	C	C	C	i-Pr	H	2-methyl-4-heptafluoroisopropylphenyl
20	1966	N	C	C	C	2,2,2-trichloroethyl	H	2-methyl-4-heptafluoroisopropylphenyl
25	1967	N	C	C	C	i-Pr	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
30	1968	N	C	C	C	2,2,2-trichloroethyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
35	1969	N	C	C	C	2-chloroethyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
40	1970	N	C	C	C	2-fluoroethyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
45	1971	N	C	C	C	Et	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
50	1972	N	C	C	C	vinyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
	1973	N	C	C	C	cyclobutyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
	1974	N	C	C	C	cyclopentyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
	1975	N	C	C	C	3-cyanobenzyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
	1976	N	C	C	C	4-cyanobenzyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
	1977	N	C	C	C	2-cyanoethyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
	1978	N	C	C	C	2-(methylthio)ethyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
	1979	N	C	C	C	2-(ethylthio)ethyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl
	1980	N	C	C	C	1-methyl-2-(methylthio)ethyl	H	2,6-dimethyl-4-heptafluoroisopropyl phenyl

Table 5(3)

Compound No.	A ₁	A ₂	A ₃	A ₄	R ₁	R ₂	Q
2001	N	C	C	C	vinyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2002	N	C	C	C	cyclobutyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2003	N	C	C	C	cyclopentyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2004	N	C	C	C	3-cyanobenzyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2005	N	C	C	C	4-cyanobenzyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)
2006	N	C	C	C	2-cyanoethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2007	N	C	C	C	2-(methylthio)ethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2008	N	C	C	C	2-(ethylthio)ethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2009	N	C	C	C	1-methyl-2-(methylthio) ethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2010	N	C	C	C	2-(ethylsulfinyl)ethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2011	N	C	C	C	2-fluoroethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2012	N	C	C	C	2,2-difluoroethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2013	N	C	C	C	2,2,2-trifluoroethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2014	N	C	C	C	1,3-difluoro-2-propyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2015	N	C	C	C	1-chloro-3-fluoro-2-propyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2016	N	C	C	C	1-methyl-2,2,2-trifluoro ethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2017	N	C	C	C	3,3,3-trifluoro-n-propyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2018	N	C	C	C	2,2,3,3,3-pentafluoro-n-propyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2019	N	C	C	C	4,4,4-trifluoro-n-butyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl
2020	N	C	C	C	2,2,3,3-tetrafluoro cyclobutyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl) phenyl

Table 5(5)

	Compound No.	A ₁	A ₂	A ₃	A ₄	R ₁	R ₂	Q
5	2041	N	C	C	C	2-(ethylsulfinyl)ethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
10	2042	N	C	C	C	2-fluoroethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
15	2043	N	C	C	C	2,2-difluoroethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
20	2044	N	C	C	C	2,2,2-trifluoroethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
25	2045	N	C	C	C	1,3-difluoro-2-propyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
30	2046	N	C	C	C	1-chloro-3-fluoro-2-propyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
35	2047	N	C	C	C	1-methyl-2,2,2-trifluoro ethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
40	2048	N	C	C	C	3,3,3-trifluoro-n-propyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
45	2049	N	C	C	C	2,2,3,3,3-pentafluoro-n-propyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
50	2050	N	C	C	C	4,4,4-trifluoro-n-butyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
55	2051	N	C	C	C	2,2,3,3-tetrafluoro cyclobutyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
60	2052	N	C	C	C	2-chloroethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
65	2053	N	C	C	C	2,2-dichloroethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
70	2054	N	C	C	C	2,2,2-trichloroethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
75	2055	N	C	C	C	1,3-dichloro-2-propyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
80	2056	N	C	C	C	3-chloro-n-propyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
85	2057	N	C	C	C	2-bromoethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
90	2058	N	C	C	C	3-bromo-n-propyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
95	2059	N	C	C	C	2-iodoethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
100	2060	N	C	C	C	(6-chloropyridin-3-yl) methyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl

Table continued

Compound No.	A ₁	A ₂	A ₃	A ₄	R ₁	R ₂	Q
2077	N-oxide	C	C	C	1,3-difluoro-2-propyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl
2078	N-oxide	C	C	C	1-chloro-3-fluoro-2-propyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl
2079	N-oxide	C	C	C	1-methyl-2,2,2-trifluoroethyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl
2080	N-oxide	C	C	C	3,3,3-trifluoro-n-propyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl

Table 5(7)

Compound No.	A ₁	A ₂	A ₃	A ₄	R ₁	R ₂	Q
2081	N-oxide	C	C	C	2,2,3,3,3-pentafluoro-n-propyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl
2082	N-oxide	C	C	C	4,9,9-trifluoro-n-butyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl
2083	N-oxide	C	C	C	2,2,3,3-tetrafluorocyclobutyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl
2084	N-oxide	C	C	C	2-chloroethyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl
2085	N-oxide	C	C	C	2,2-dichloroethyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl
2086	N-oxide	C	C	C	1,3-dichloro-2-propyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl
2087	N-oxide	C	C	C	3-chloro-n-propyl	H	2,6-dimethyl-9-heptafluoroisopropylphenyl
2088	N-oxide	C	C	C	2-bromoethyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl
2089	N-oxide	C	C	C	3-bromo-n-propyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl
2090	N-oxide	C	C	C	2-iodoethyl	H	2,6-dimethyl-4-heptafluoroisopropylphenyl

Table continued

	Compound No.	A ₁	A ₂	A ₃	A ₄	R ₁	R ₂	Q Q
5	2105	N-oxide	C	C	C	2,2-difluoroethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
10	2106	N-oxide	C	C	C	2,2,2-trifluoroethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
15	2107	N-oxide	C	C	C	1,3-difluoro-2-propyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
20	2108	N-oxide	C	C	C	1-chloro-3-fluoro-2-propyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
25	2109	N-oxide	C	C	C	1-methyl-2,2,2-trifluoroethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
30	2110	N-oxide	C	C	C	3,3,3-trifluoro-n-propyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
35	2111	N-oxide	C	C	C	2,2,3,3,3-pentafluoro-n-propyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
40	2112	N-oxide	C	C	C	4,4,4-trifluoro-n-butyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
45	2113	N-oxide	C	C	C	2,2,3,3-tetrafluoro cyclobutyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
50	2114	N-oxide	C	C	C	2-chloroethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
55	2115	N-oxide	C	C	C	2,2-dichloroethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	2116	N-oxide	C	C	C	2,2,2-trichloroethyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	2117	N-oxide	C	C	C	1,3-dichloro-2-propyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	2118	N-oxide	C	C	C	3-chloro-n-propyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl
	2119	N-oxide	C	C	C	2-bromoethyl	H	2,6-dimethyl-4-(nonafluoro-2-yutyl)phenyl
	2120	N-oxide	C	C	C	3-bromo-n-propyl	H	2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl

Table continued

Compound No.	A ₁	A ₂	A ₃	A ₄	R ₁	R ₂	Q
5 2136	N-oxide	C	C	C	2,2-difluoroethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
10 2137	N-oxide	C	C	C	2,2,2-trifluoroethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
15 2138	N-oxide	C	C	C	1,3-difluoro-2-propyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
20 2139	N-oxide	C	C	C	1-chloro-3-fluoro-2-propyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
2140	N-oxide	C	C	C	1-methyl-2,2,2-trifluoroethyl	H H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl

Table 5(10)

Compound No.	A ₁	A ₂	A ₃	A ₄	R ₁	R ₂	Q
25 2141	N-oxide	C	C	C	3,3,3-trifluoro-n-propyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
30 2192	N-oxide	C	C	C	2,2,3,3,3-pentafluoro-n-propyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
35 2143	N-oxide	C	C	C	4,4,4-trifluoro-n-butyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
40 2144	N-oxide	C	C	C	2,2,3,3-tetrafluoro cyclobutyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
45 2145	N-oxide	C	C	C	2-chloroethyl	H	2,6-dibromo-9-(heptafluoro-n-propylthio)phenyl
50 2146	N-oxide	C	C	C	2,2-dichloroethyl	H	2,6-dibromo-9-(heptafluoro-n-propylthio)phenyl
55 2147	N-oxide	C	C	C	2,2,2-trichloroethyl	H	2,6-dibromo-4-(heptafluoro-n-propylthio)phenyl
2148	N-oxide	C	C	C	1,3-dichloro-2-propyl	H	2,6-dibromo-9-(heptafluoro-n-propylthio)phenyl
2149	N-oxide	C	C	C	3-chloro-n-propyl	H	2,6-dibromo-9-(heptafluoro-n-propylthio)phenyl

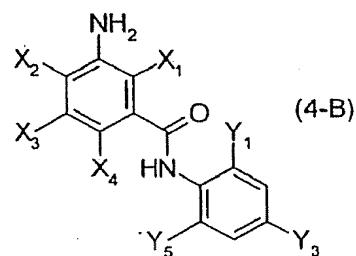
Table 6(1)

	Compound No.	R_3	Y_1	Y_2	Y_3	Y_4	Y_5
							(4-A)
5	I-1	H	Me	H	heptafluoro-n-propyl	H	Me
10	I-2	H	H	H	heptafluoroisopropyl	H	H
15	I-3	H	H	Me	heptafluoroisopropyl	H	H
20	I-4	H	H	MeO	heptafluoroisopropyl	H	H
25	I-5	H	H	Cl	heptafluoroisopropyl	H	H
30	I-6	H	Me	H	heptafluoroisopropyl	H	H
35	I-7	H	Me	H	heptafluoroisopropyl	H	Me
40	I-8	H	Me	H	heptafluoroisopropyl	H	phenyl
45	I-9	H	Me	H	heptafluoroisopropyl	Me	H
50	I-10	H	Me	Me	heptafluoroisopropyl	H	H
55	I-11	H	Me	Me	heptafluoroisopropyl	H	Cl
	I-12	H	Me	I	heptafluoroisopropyl	H	Cl
	I-13	Me	Me	H	heptafluoroisopropyl	H	Me
	I-14	i-Pr	Me	H	heptafluoroisopropyl	H	Me
	I-15	H	Et	H	heptafluoroisopropyl	H	H
	I-16	H	Et	H	heptafluoroisopropyl	H	Me
	I-17	H	Et	H	heptafluoroisopropyl	H	Et
	I-18	H	Et	H	heptafluoroisopropyl	H	I
	I-19	H	n-Pr	H	heptafluoroisopropyl	H	H
	I-20	H	i-Pr	H	heptafluoroisopropyl	H	Me
	I-21	H	MeO	H	heptafluoroisopropyl	H	Me
	I-22	H	Cl	H	heptafluoroisopropyl	H	Et
	I-23	H	Cl	H	heptafluoroisopropyl	Me	H
	I-24	H	Cl	H	heptafluoroisopropyl	MeO	H
	I-25	H	Cl	Me	heptafluoroisopropyl	H	Me

Table 6(2)

Compound No.	R_3	Y_1	Y_2	Y_3	Y_4	Y_5
I-26	H	Br	H	heptafluoroisopropyl	H	Me
I-27	H	Br	H	heptafluoroisopropyl	H	Et

Table continued



	Compound No.	X ₁	X ₂	X ₃	X ₄	Y ₁	Y ₃	Y ₅
5	1-56	H	H	H	Me	Me	heptafluoroisopropyl	Me
10	I-59	F	H	H	H	Me	heptafluoroisopropyl	Me
15	1-60	F	H	H	H	Me	heptafluoroisopropylthio	Me
20	I-61	H	F	H	H	Me	heptafluoroisopropyl	Me
25	I-62	H	H	H	F	Me	heptafluoroisopropyl	H
30	1-63	H	H	H	F	Me	heptafluoroisopropyl	Me
35	I-64	Cl	H	H	H	Me	heptafluoroisopropyl	H
40	I-65	Cl	H	H	H	Me	heptafluoroisopropyl	Me
45	1-66	H	Cl	H	H	Me	heptafluoroisopropyl	H
50	1-67	H	Cl	H	H	Me	heptafluoroisopropyl	Me
55	I-68	H	H	H	C1	Me	heptafluoroisopropyl	H
	1-69	H	H	H	C1	Me	heptafluoroisopropyl	Me
	1-70	Br	H	H	H	Me	heptafluoroisopropyl	Me
	1-71	H	H	H	Br	Me	heptafluoroisopropyl	H
	I-72	H	I	H	H	Me	heptafluoroisopropyl	H
	I-73	H	H	H	I	Me	heptafluoroisopropyl	H
	1-74	H	H	H	I	Me	heptafluoroisopropyl	Me
	I-75	H	H	CF ₃	H	Me	heptafluoroisopropyl	H
	1-76	H	H	CF ₃	H	Me	heptafluoroisopropyl	Me
	1-77	H	MeO	H	H	Me	heptafluoroisopropyl	H
	I-78	H	H	NH ₂	H	Me	heptafluoroisopropyl	H
	1-79	H	H	NH ₂	H	Me	heptafluoroisopropyl	Me
	I-80	Cl	Cl	H	Cl	Me	heptafluoroisopropyl	H

Table continued

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
5 14	δ 2.38(3H,s), 5.19(2H,s), 7.19(1H,s), 7.32-7.61(10H,m), 7.91(1H,s), 8.00(1H,s), 8.18(1H,d, J=8.5Hz)
10 16	δ 2.34 (3H, s), 5.27(2H, s), 6.96 (1H, br-s), 7.40-7.58 (6H, m), 7.63-7.69 (3H, m), 7.79 (1H, s), 8.00 (1H, s), 8.25 (1H, d, J=8.8Hz)
17	δ 2.33(3H, s), 3.34(3H, s), 3.57-3.61(2H, m), 4.26-4.32(2H, m), 7.13(1H, s), 7.32-7.42(3H, m), 7.46-7.53(2H, m), 7.83(1H, s), 7.91(1H, d, J = 1.7Hz), 8.13(1H, d, J=8.5Hz)
18	δ 2.42(3H,s), 5.83(2H,s), 7.16(1H,br-s), 7.43-7.52(3H,m), 7.61(1H,d,J=8.1Hz), 7.68(1H,d, J=8.1Hz), 7.82(1H,s), 8.03(1H,s), 8.25(1H,d,J=8.5Hz)

Table 9(2)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
18	δ 2.42(3H,s), 5.83(2H,s), 7.16(1H,br-s), 7.43-7.52(3H,m), 7.61(1H,d,J=8.1Hz), 7.68(1H,d, J=8.1Hz), 7.82(1H,s), 8.03(1H,s), 8.25(1H,d,J=8.5Hz)
19	δ 2.40(3H, s), 3.74(2H, t, J=5.6Hz), 4.44(2H, t, J=5.6Hz), 7.19(1H, s), 7.42-7.50(3H, m), 7.55-7.58 (1H, m), 7.63(1H, d, J=7.6Hz), 7.88(1H, s), 8.01(1H, s), 8.22(1H, d, J=8.8Hz)
20 21	δ 2.40(3H,s), 4.83(2H,s), 7.42-7.49(3H,m), 7.58-7.61(1H,m), 7.67-7.69(2H,m), 7.98(1H,s), 8.06 (1H,s), 8.19(1H,d,J=8.5Hz)
22	δ 2.01(6H,s), 2.42(3H,s), 6.95(1H,br), 7.44-7.52(3H,m), 7.57-7.62(2H,m), 7.80(1H,s), 8.02(1H,s), 8.24(1H,d,J=8.5Hz)
23	δ 2.41(3H,s), 7.23-7.29(1H,m), 7.40-7.55(7H,m), 7.61-7.64(1H,m), 7.72(1H,d,J=8.3Hz), 7.78(1H, s), 8.07(1H,s), 8.26(1H,d,J=8.8Hz)
24	δ 2.36(3H,s), 2.40(3H,s), 7.05-7.09(2H,m), 7.15(1H,s), 7.20(2H,d,J=8.1Hz), 7.47-7.52 (3H,m), 7.60-7.63(1H,m), 7.66-7.68(1H,m), 7.79(1H,s), 8.07(1H,s), 8.25(1H,d,J=8.8Hz)
25	δ 2.41(3H,s), 7.12-7.17(2H,m), 7.32-7.38(2H,m), 7.42-7.48(3H,m), 7.64(1H,d,J= 7.8Hz), 7.82(1H, d,J=7.8Hz), 7.99(1H,d,J=8.5Hz), 8.06(1H,d,J=8.5Hz), 8.51(1H,s), 9.52(1H,s)
59	δ 2.32(6H, s), 3.79(3H, s), 6.92(1H, br-s), 7.34(2H, s), 7.43(1H, t, J=7.8Hz), 7.52-7.62(3H, m), 8.00 (1H, s)
60	δ 1.33(3H, t, J = 7.1Hz), 2.33(6H, s), 4.24(2H, q, J=7.1Hz), 6.80(1H, s), 7.35(2H, s), 7.44(1H, t, J=7.8Hz), 7.46(1H, s), 7.52-7.61(2H, m), 8.02(1H, s)
61	δ 0.99(3H, t, J=7.3Hz), 1.71(2H, m), 2.34(6H, s), 4.14(2H, t, J=6.9Hz), 6.79(1H, s), 7.35(2H, s), 7.41-7.47(2H, m), 7.59-7.61(2H, m), 8.02(1H, s)
62	δ 1.31(6H, d, J=6.3Hz), 2.33(6H, s), 5.03(1H, septet, J=6.3Hz), 6.74(1H, s), 7.35(2H, s), 7.43(1H, t, J=8.1Hz), 7.52(1H, s), 7.56-7.61(2H, m), 8.03(1H, s)
63	δ 0.96(3H, t, J=7.3Hz), 1.38-1.48(2H, m), 1.61-1.71(2H, m), 2.34(6H, s), 4.19(2H, t, J=6.9Hz), 6.76 (1H, s), 7.35(2H, s), 7.42-7.46(2H, m), 7.58-7.61(2H, m), 8.02(1H, s)
64	δ 0.98(6H, d, J=6.8Hz), 1.94-2.04(1H, m), 2.34(6H, s), 3.97(2H, d, J=6.6Hz), 6.79(1H, s), 7.35(2H, s), 7.42-7.47(2H, m), 7.59-7.61(2H, m), 8.02(1H, s)

Table continued

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
5	δ 2.33(6H, s), 5.18(2H, s), 6.92(1H, s), 7.22-7.34(5H, m), 7.40-7.47(3H, m), 7.59-7.63(2H, m), 8.02 (1H, s)
	δ 2.33(6H, s), 5.18(2H, s), 6.86(1H, s), 7.29-7.38(6H, m), 7.43-7.47(2H, m), 7.60-7.62(2H, m), 8.01 (1H, s)
10	δ 2.34 (6H, s), 5.32 (2H, s), 6.92 (1H, br-s), 7.36 (2H, s), 7.42 (1H, s), 7.48 (1H, t, J=7.8Hz), 7.58 (2H, d, J=9.0Hz), 7.62-7.66 (2H, m), 8.01 (1H, s), 8.25 (2H, d, J=9.0Hz)
	δ 2.35 (6H, s), 3.93 (3H, s), 5.28 (2H, s), 6.88 (1H, br-s), 7.36 (2H, s), 7.41 (1H, s), 7.45-7.49 (4H, m), 7.63 (2H, d, J=6.8Hz), 8.02 (1H, s), 8.05 (1H, d, J = 6.8Hz)
15	δ 2.32 (6H, s), 2.62 (1H, br), 3.87 (2H, t, J =4.4Hz), 4.29-4.32 (2H, m), 7.26 (1H, s), 7.34 (2H, s), 7.42 (1H, t, J=8.1Hz), 7.54-7.61 (2H, m), 7.77 (1H, s), 8.00 (1H, s)
	δ 2.31(6H, s), 3.41(3H, s), 3.64-3.66(2H, m), 4.32-4.35(2H, m), 7.14(1H, s), 7.34(2H, s), 7.40(1H, t, J=7.8Hz), 7.55-7.60(2H, m), 7.67(1H, s), 8.00(1H, s)
20	δ 1.23(3H, t, J = 6.8Hz), 2.29(6H, s), 3.56(2H, q, J=6.8Hz), 3.67-3.70(2H, m), 4.31-4.34(2H, m), 7.26(1H, s), 7.33(2H, s), 7.38-7.40(1H, m), 7.52-7.60(2H, m), 7.83(1H, s), 8.00(1H, s)
	δ 1.18(6H, d, J=6.1Hz), 2.29(6H, s), 3.63-3.69(3H, m), 4.30-4.32(2H, m), 7.26(1H, s), 7.33(2H, s), 7.38(1H, t, J=7.8Hz), 7.56-7.60(2H, m), 7.82(1H, s), 8.00(1H, s)
25	δ 2.28 (6H, s), 3.70-3.73 (2H, m), 4.33-4.36 (2H, m), 4.57 (2H, s), 7.23-7.39 (9H, m), 7.53 (1H, d, J=7.8Hz), 7.58 (1H, d, J=7.8Hz), 7.87 (1H, s), 7.99 (1H, s)
	δ 1.20 (3H, t, J=8.1Hz), 1.95-2.00 (2H, m), 2.35 (6H, s), 3.47-3.57 (4H, m), 4.30 (2H, t, J=6.6Hz), 6.78 (1H, s), 7.35 (2H, s), 7.46 (2H, t, J=7.8Hz), 7.61 (2H, d, J=7.8Hz), 8.02 (1H, s)

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Table 9(5)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
35	δ 1.30(3H, t, J=7.3Hz), 2.34(6H, s), 4.26(2H, q, J=7.3Hz), 4.72(2H, s), 7.35(2H, s), 7.36-7.40(1H, m), 7.52-7.60(3H, m), 7.77-7.79(1H, m), 7.90(1H, br-s)
	δ 1.56(3H, d, J=7.3Hz), 2.33(6H, s), 3.79(3H, s), 5.18(1H, q, J=7.3Hz), 7.21(1H, br), 7.35(2H, s), 7.41(1H, t, J=7.8Hz), 7.55-7.62(3H, m), 7.98(1H, s)
40	δ 1.29(3H, t, J=6.8Hz), 1.55(3H, d, J=6.8Hz), 2.34(6H, s), 4.23(2H, q, J=6.8Hz), 5.16(1H, q, J=6.8Hz), 7.24(1H, br), 7.35(2H, s), 7.41(1H, t, J=7.8Hz), 7.55-7.62(3H, m), 7.96(1H, s)
	δ 2.21(3H, s), 2.34(6H, s), 2.84(2H, t, J=6.1Hz), 4.46(2H, t, J=6.1Hz), 6.91(1H, br-s), 7.35(2H, s), 7.43(1H, t, J=7.8Hz), 7.52-7.70(3H, m), 8.01(1H, s)
45	δ 2.10(3H, s), 2.34(6H, s), 4.33-4.42(4H, m), 6.97(1H, br-s), 7.35(2H, s), 7.45(1H, t, J=7.8Hz), 7.57-7.64(3H, m), 8.01(1H, s)
	δ 2.33(6H, s), 2.78(2H, t, J=6.3Hz), 4.40(2H, t, J=6.3Hz), 7.12(1H, br), 7.35(2H, s), 7.45(1H, t, J=7.8Hz), 7.60-7.65(3H, m), 8.01(1H, s)
50	δ 2.17(3H, s), 2.34(6H, s), 2.80(2H, t, J=6.6Hz), 4.37(2H, t, J=6.6Hz), 6.84(1H, br-s), 7.35(2H, s), 7.43-7.52(2H, m), 7.58-7.63(2H, m), 8.02(1H, s)
	δ 1.25-1.31(3H, m), 2.33(6H, s), 2.57-2.64(2H, m), 2.81-2.85(2H, m), 4.32-4.38(2H, m), 6.92(1H, s), 7.35(2H, s), 7.42-7.49(1H, m), 7.58-7.63(3H, m), 8.03(1H, s)
55	δ 1.28(6H, d, J=6.6Hz), 2.34(6H, s), 2.84(2H, t, J=7.1Hz), 2.94-3.04(1H, m), 4.34(2H, t, J=7.1Hz), 6.88(1H, s), 7.35(2H, s), 7.42-7.49(1H, m), 7.52-7.64(3H, m), 8.02(1H, s)
	δ 1.40(3H, d, J=6.1Hz), 2.17(3H, s), 2.34(6H, s), 2.67(1H, dd, J=6.1Hz, 13.7Hz), 2.77(1H, dd, J=6.1Hz, 13.7Hz), 5.08(1H, sextett, J=6.1Hz), 6.80(1H, s), 7.35(2H, s), 7.45(1H, t, J=7.8Hz), 7.5a (1H, s), 7.57-7.63(2H, m), 8.04(1H, s)

Table 9(7)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
5 134	δ 2.35(6H, s), 3.83(4H, d, J=5.1Hz), 5.22(1H, quint, J=5.1Hz), 6.93(1H, s), 7.36(2H, s), 7.43(1H, s), 7.48(1H, t, J=7.8Hz), 7.60-7.66(2H, m), 8.03(1H, s)
	δ 2.01(6H, s), 2.35(6H, s), 6.88(1H, br), 7.36(2H, s), 7.43-7.52(2H, m), 7.58-7.65(2H, m), 8.03(1H, s)
10 135	δ 2.17(2H, quint, J=6.3Hz), 2.34(6H, s), 3.66(2H, t, J=6.3Hz), 4.36(2H, t, J=6.3Hz), 6.83(1H, s), 7.35(2H, s), 7.43-7.48(1H, m), 7.52(1H, s), 7.59-7.63(2H, m), 8.02(1H, s)
	δ 2.35(6H, s), 3.59(2H, t, J=5.9Hz), 4.51(2H, t, J=5.9Hz), 6.86(1H, br), 7.36(2H, s), 7.43-7.52(2H, m), 7.60-7.64(2H, m), 8.02(1H, s)
15 136	δ 2.34(6H, s), 5.03(2H, s), 7.15(1H, br), 7.35(2H, s), 7.47-7.54(2H, m), 7.64-7.69(2H, m), 8.06(1H, s)
	δ 2.25(2H, quint, J=6.1Hz), 2.34(6H, s), 3.51(2H, t, J=6.1Hz), 4.35(2H, t, J=6.1Hz), 6.83(1H, s), 7.35(2H, s), 7.46(1H, t, J=8.1Hz), 7.54(1H, s), 7.58-7.64(2H, m), 8.02(1H, s)
20 137	δ 2.34(6H, s), 3.34-3.39(2H, m), 4.42-4.47(2H, m), 6.91-6.99(1H, br), 7.35(2H, s), 7.43-7.49(1H, m), 7.56-7.64(3H, m), 8.03(1H, s)
	(DMSO-d ₆) δ 1.82(3H, s), 2.28(6H, s), 3.33(2H, q, J=5.9Hz), 4.11(2H, t, J=5.9Hz), 7.44(2H, s), 7.46(1H, d, J=7.8Hz), 7.62-7.69(2H, m), 8.04(1H, t, J=5.9Hz), 8.09(1H, s), 9.90(1H, s), 9.93(1H, s)
25 138	δ 2.34(6H, s), 2.36(3H, s), 7.05-7.08(2H, m), 7.17-7.20(2H, m), 7.33(2H, s), 7.43(1H, t, J=7.8Hz), 7.68(1H, d, J=7.8Hz), 7.80(1H, d, J=7.8Hz), 8.17(1H, s), 8.67(1H, s), 9.29(1H, s)
	δ 2.35(6H, s), 7.33(2H, s), 7.41-7.57(5H, m), 7.72(1H, d, J=7.8Hz), 7.82(1H, d, J=7.8Hz), 8.18(1H, s), 9.01(1H, s), 9.73(1H, s)
30 139	δ 2.35(6H, s), 7.13-7.18(2H, m), 7.32-7.37(4H, m), 7.41-7.45(1H, m), 7.70(1H, d, J=7.6Hz), 7.81(1H, d, J=7.6Hz), 8.16(1H, s), 9.04(1H, s), 9.69(1H, s)
	δ 2.34(6H, s), 7.32(2H, s), 7.33-7.36(1H, m), 7.42-7.52(3H, m), 7.65(1H, d, J=2.4Hz), 7.70(1H, d, J=7.8Hz), 7.80-7.88(4H, m), 8.20(1H, s), 8.76(1H, s), 9.48(1H, s)
35 140	δ 2.08-2.14 (1H, m), 2.18-2.30 (1H, m), 2.35 (6H, s), 3.86-4.01 (4H, m), 5.37-5.39 (1H, m), 6.87 (1H, br-s), 7.35 (2H, s), 7.46 (2H, t, J=7.6Hz), 7.58-7.63 (2H, m), 8.01 (1H, s)
	δ 2.34 (6H, s), 5.18 (2H, s), 6.38 (1H, d, J=3.2Hz), 6.48 (1H, d, J=3.2Hz), 6.83 (1H, br-s), 7.35 (2H, s), 7.43-7.47 (3H, m), 7.57-7.63 (2H, m), 8.01 (1H, s)
40 141	δ 2.34 (6H, s), 5.10 (2H, s), 6.48 (1H, s), 6.79 (1H, br-s), 7.35 (2H, s), 7.39-7.47 (3H, m), 7.53 (1H, s), 7.59-7.63 (2H, m), 8.01 (1H, br-s)
	δ 1.82(3H, s), 2.28(6H, s), 3.33(2H, q, J=5.9Hz), 4.11(2H, t, J=5.9Hz), 7.44(2H, s), 7.46(1H, d, J=7.8Hz), 7.62-7.69(2H, m), 8.04(1H, t, J=5.9Hz), 8.09(1H, s), 9.90(1H, s), 9.93(1H, s)
45 146	δ 2.34(6H, s), 2.36(3H, s), 7.05-7.08(2H, m), 7.17-7.20(2H, m), 7.33(2H, s), 7.43(1H, t, J=7.8Hz), 7.68(1H, d, J=7.8Hz), 7.80(1H, d, J=7.8Hz), 8.17(1H, s), 8.67(1H, s), 9.29(1H, s)
	δ 2.35(6H, s), 7.33(2H, s), 7.41-7.57(5H, m), 7.72(1H, d, J=7.8Hz), 7.82(1H, d, J=7.8Hz), 8.18(1H, s), 9.01(1H, s), 9.73(1H, s)
50 147	δ 2.34(6H, s), 7.32(2H, s), 7.33-7.36(1H, m), 7.42-7.52(3H, m), 7.65(1H, d, J=2.4Hz), 7.70(1H, d, J=7.8Hz), 7.80-7.88(4H, m), 8.20(1H, s), 8.76(1H, s), 9.48(1H, s)
	δ 2.08-2.14 (1H, m), 2.18-2.30 (1H, m), 2.35 (6H, s), 3.86-4.01 (4H, m), 5.37-5.39 (1H, m), 6.87 (1H, br-s), 7.35 (2H, s), 7.46 (2H, t, J=7.6Hz), 7.58-7.63 (2H, m), 8.01 (1H, s)
55 148	δ 2.34 (6H, s), 5.18 (2H, s), 6.38 (1H, d, J=3.2Hz), 6.48 (1H, d, J=3.2Hz), 6.83 (1H, br-s), 7.35 (2H, s), 7.43-7.47 (3H, m), 7.57-7.63 (2H, m), 8.01 (1H, s)
	δ 2.34 (6H, s), 5.10 (2H, s), 6.48 (1H, s), 6.79 (1H, br-s), 7.35 (2H, s), 7.39-7.47 (3H, m), 7.53 (1H, s), 7.59-7.63 (2H, m), 8.01 (1H, br-s)

Table 9(8)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
45 157	δ 1.58-1.67 (1H, m), 1.93-1.95 (2H, m), 2.01-2.09 (1H, m), 2.34 (6H, s), 3.78-3.93 (2H, m), 4.06-4.23 (2H, m), 4.31 (1H, dd, J=3.2Hz, 11.2Hz), 6.95 (1H, br-s), 7.35 (2H, s), 7.45 (2H, t, J=7.8Hz), 7.50-7.56 (1H, m), 7.63 (1H, d, J=7.1Hz), 8.04 (1H, s)
	δ 1.66-1.73 (1H, m), 2.05-2.13 (1H, m), 2.34 (6H, s), 2.60-2.70 (1H, m), 3.64-3.68 (1H, m), 3.73-3.79 (1H, m), 3.85-3.92 (2H, m), 4.09-4.15 (2H, m), 6.87 (1H, br-s), 7.35 (2H, s), 7.46 (2H, t, J=7.8Hz), 7.61-7.66 (2H, m), 8.01 (1H, br-s)
50 158	δ 2.34 (6H, s), 5.38 (2H, s), 6.83 (1H, br-s), 6.98-7.02 (1H, m), 7.16 (1H, d, J=2.9Hz), 7.34-7.36 (3H, m), 7.43-7.47 (2H, m), 7.59-7.63 (2H, m), 8.01 (1H, s)
	δ 2.34 (6H, s), 5.23 (2H, s), 6.83 (1H, br-s), 7.14 (1H, d, J=5.1Hz), 7.33-7.37 (4H, m), 7.45 (2H, t, J=7.8Hz), 7.61-7.64 (2H, m), 8.02 (1H, s)
55 159	δ 1.58-1.67 (1H, m), 1.93-1.95 (2H, m), 2.01-2.09 (1H, m), 2.34 (6H, s), 3.78-3.93 (2H, m), 4.06-4.23 (2H, m), 4.31 (1H, dd, J=3.2Hz, 11.2Hz), 6.95 (1H, br-s), 7.35 (2H, s), 7.45 (2H, t, J=7.8Hz), 7.50-7.56 (1H, m), 7.63 (1H, d, J=7.1Hz), 8.04 (1H, s)
	δ 1.66-1.73 (1H, m), 2.05-2.13 (1H, m), 2.34 (6H, s), 2.60-2.70 (1H, m), 3.64-3.68 (1H, m), 3.73-3.79 (1H, m), 3.85-3.92 (2H, m), 4.09-4.15 (2H, m), 6.87 (1H, br-s), 7.35 (2H, s), 7.46 (2H, t, J=7.8Hz), 7.61-7.66 (2H, m), 8.01 (1H, br-s)
60 160	δ 2.34 (6H, s), 5.38 (2H, s), 6.83 (1H, br-s), 6.98-7.02 (1H, m), 7.16 (1H, d, J=2.9Hz), 7.34-7.36 (3H, m), 7.43-7.47 (2H, m), 7.59-7.63 (2H, m), 8.01 (1H, s)
	δ 2.34 (6H, s), 5.23 (2H, s), 6.83 (1H, br-s), 7.14 (1H, d, J=5.1Hz), 7.33-7.37 (4H, m), 7.45 (2H, t, J=7.8Hz), 7.61-7.64 (2H, m), 8.02 (1H, s)

Table continued

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
5 179	δ1.31 (6H, d, J=6.1Hz), 2.61 (3H, d, J=6.3Hz), 5.05 (1H, septet, J=6.1Hz), 6.76 (1H, brs), 7.45-7.58 (3H, m), 7.70 (1H, d, J=8.1Hz), 7.96 (1H, t, J=1.8Hz), 8.56-8.58 (1H, m), 8.70 (1H, br s)
10 180	δ 1.24(3H, t, J=7.6Hz), 1.31(6H, d, J=6.3Hz), 2.75(2H, q, J=7.6Hz), 5.03(1H, septet, J=6.3Hz), 6.74(1H, s), 7.42-7.47(2H, m), 7.57-7.67(4H, m), 8.02(1H, s)
15 181	δ 0.93(3H, t, J=7.3Hz), 1.32(6H, d, J=6.1Hz), 1.63-1.71(2H, m), 2.70(2H, t, J=7.6Hz), 5.04(1H, septet, J=6.1Hz), 6.72(1H, s), 7.44-7.48(2H, m), 7.57-7.63(3H, m), 7.68(1H, s), 8.02(1H, s)
20 182	δ1.32 (6H, d, J=6.4Hz), 3.92 (3H, s), 5.06 (1H, septet, J=6.4Hz), 6.73 (1H, s), 7.46-7.50 (1H, m), 7.55-7.60 (2H, m), 7.69 (1H, d, J=7.8Hz), 7.96 (1H, s), 8.48 (1H, d, J=1.2Hz), 8.58 (1H, s)
25 183	δ1.31 (6H, d, J=6.2Hz), 2.30 (3H, s), 2.44 (3H, d, J=6.4Hz), 5.01-5.05 (1H, m), 6.72 (1H, br-s), 7.44-7.48 (2H, m), 7.61-7.62 (2H, m), 7.78 (1H, s), 8.03 (1H, br-s)
30 184	δ 1.32 (6H, d, J=6.1Hz), 2.35 (3H, s), 2.58 (3H, d, J=6.8Hz), 5.01-5.07 (1H, m), 6.68 (1H, br-s), 7.35 (1H, s), 7.46 (1H, t, J=7.8Hz), 7.61-7.65 (2H, m), 7.72 (1H, s), 8.01 (1H, s)
35 185	δ1.31 (6H, d, J=6.4Hz), 2.49 (3H, s), 4.77 (2H, br-s), 5.06 (1H, sept, J=6.4Hz), 6.73 (1H, br-s), 7.44-7.49 (1H, m), 7.55 (1H, s), 7.61-7.63 (2H, m), 7.81 (1H, s), 8.05 (1H, br-s)
40 186	δ1.32 (6H, d, J=6.4Hz), 2.61 (3H, s), 5.05 (1H, septet), 6.73 (1H, br-s), 7.44-7.48 (2H, m), 7.57-7.64 (2H, m), 7.95 (1H, br-s), 8.06 (1H, br-s)

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Table 9(10)

Compound No.	¹ H-NMR (CDCl ₃ ,ppm)
30 187	δ 4.84(2H, s), 7.28(1H, br), 7.45(1H, t, J=8.1Hz), 7.59-7.65(4H, m), 7.81(2H, d, J=8.5Hz), 7.99(1H, s), 8.17(1H, s)
35 188	δ 2.53 (3H, d, J=8.8Hz), 4.85 (2H, s), 7.15 (1H, br s), 7.45-7.65 (6H, m), 8.00-8.02 (2H, m)
40 189	δ 1.34(3H, t, J=7.6Hz), 2.75(2H, q, J=7.6Hz), 4.85(2H, s), 7.10(1H, s), 7.47-7.52(3H, m), 7.59-7.66 (2H, m), 7.87(1H, s), 8.05(1H, s), 8.27(1H, d, J=8.8Hz)
45 190	δ 1.02(3H, t, J=7.3Hz), 1.67-1.77(2H, m), 2.70(2H, t, J=7.6Hz), 4.85(2H, s), 7.10(1H, br-s), 7.44-7.52(3H, m), 7.59-7.65(2H, m), 7.88(1H, s), 8.07(1H, s), 8.30(1H, d, J=8.5Hz)
50 191	δ3.89 (3H, s), 4.85 (2H, s), 7.06 (1H, dd, J=8.5Hz, 2.0Hz), 7.18 (1H, br s), 7.46-7.54 (2H, m), 7.61-7.63 (2H, m), 7.79-7.80 (1H, m), 8.01 (1H, s), 8.10 (1H, s)
55 192	δ4.86(2H,s), 7.09(1H,br.), 7.43-7.79(5H,m), 8.03(1H,br.), 8.56(1H,br), 8.76(1H,d,J=8.8Hz)
193	δ4.86 (2H, s), 7.16 (1H, br s), 7.47-7.74 (5H, m), 7.93 (1H, s), 8.02 (1H, s), 8.23 (1H, s)
194	δ2.30 (3H, s), 2.47 (3H, d, J=6.0Hz), 4.85 (2H, s), 7.12 (1H, br-s), 7.42 (1H, d, J=9.0Hz), 7.49 (1H, t, J=8.1Hz), 7.62-7.67 (2H, m), 7.78-7.81 (2H, m), 8.03 (1H, br-s)
195	δ2.35 (3H, s), 2.52 (3H, d, J=8.8Hz), 4.86 (2H, s), 7.05 (1H, br-s), 7.31 (1H, s), 7.50 (1H, t, J=7.8Hz), 7.60-7.67 (2H, m), 7.71 (1H, s), 8.03 (1H, s), 8.07 (1H, s)
196	δ 1.23(6H, t, J=7.6Hz), 2.70(4H, q, J=7.6Hz), 4.85(2H, s), 7.03(1H, br), 7.39(3H, s), 7.50(1H, t, J=8.1Hz), 7.65(1H, d, J=8.1Hz), 7.69(1H, br-s), 8.04(1H, s)
197	δ 1.23(3H, t, J=7.6Hz), 2.35(3H, s), 2.69(2H, q, J=7.6Hz), 4.85(2H, s), 7.05(1H, br), 7.37(2H, s), 7.42(1H, s), 7.50(1H, t, J=7.8Hz), 7.64-7.66(2H, m), 8.04(1H, s)
198	δ1.23 (6H, d, J=6.8Hz), 2.34 (3H, s), 3.17 (1H, septet, J=6.8Hz), 4.85 (2H, s), 7.18 (1H, br-s), 7.36 (1H, s), 7.42 (1H, s), 7.49 (1H, t, J=8.1Hz), 7.55 (1H, s), 7.65-7.67 (2H, m), 8.05 (1H, s)
199	δ2.36(3H, s), 3.86(3H, s), 4.85(2H, s), 6.96(1H, s), 7.01(1H, br), 7.14(1H, s), 7.49(1H, t, J=8.1Hz), 7.64-7.68(3H, m), 7.99(1H, s)

Table continued

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
5	219 δ 2.62 (3H, s), 4.86 (2H, s), 7.00 (1H, br-s), 7.47 (1H, s), 7.52 (1H, t, J=7.8Hz), 7.68-7.70 (2H, m), 7.89 (1H, br-s), 8.07 (1H, br-s)
	220 δ 2.12 (3H, s), 4.50 (2H, br-s), 4.86 (2H, s), 7.14 (1H, br-s), 7.29 (1H, br-s), 7.51 (1H, t, J=7.8Hz), 7.68-7.70 (2H, m), 7.77 (1H, br-s), 8.04 (1H, br-s)
10	221 δ 0.90(3H, t, J=7.3Hz), 1.28-1.37(2H, m), 1.55-1.63(2H, m), 2.48-2.60(2H, m), 2.73(2H, t, J=7.8Hz), 4.43(2H, t, J=6.3Hz), 6.85(1H, s), 7.46-7.50(2H, m), 7.60-7.68(3H, m), 7.73(1H, d, J=1.5Hz), 8.00 (1H, s)
	222 δ 1.32 (6H, d, J=6.3Hz), 2.39 (3H, s), 5.04 (1H, septet, J=6.3Hz), 6.71 (1H, s), 7.43-7.47 (2H, m), 7.57-7.64 (3H, m), 7.73 (1H, s), 8.04 (1H, s)
15	223 δ 1.32(6H, d, J=6.3Hz), 5.03(1H, septet, J=6.3Hz), 7.41(1H, t, J=8.1Hz), 7.63-7.68(1H, m), 7.67 (2H, s), 7.75(1H, d, J=7.6Hz), 8.00(1H, s), 8.06(1H, t, J=1.7Hz), 8.93(1H, s)
	224 (DMSO-d ₆) δ 1.31(6H, d, J=6.3Hz), 5.03(1H, septet, J=6.3Hz), 7.41(1H, t, J=8.1Hz), 7.64(1H, d, J=8.1Hz), 7.79(1H, d, J=8.1Hz), 7.93(1H, s), 8.00(1H, s), 8.15(1H, s), 8.26(1H, s), 9.36(1H, s)
20	225 δ 1.31(6H, d, J=6.3Hz), 2.34(6H, s), 5.03(1H, septet, J=6.3Hz), 6.73(1H, s), 7.33(2H, s), 7.44(1H, t, J=7.8Hz), 7.53-7.62(3H, m), 8.05(1H, s)
	226 δ 1.31(6H, d, J=6.3Hz), 2.33(6H, s), 5.02(1H, septet, J=6.3Hz), 6.75(1H, s), 7.33(2H, s), 7.43(1H, t, J=7.8Hz), 7.52-7.61(3H, m), 8.04(1H, s)
25	227 δ 4.84(2H, s), 7.24(1H, s), 7.45(1H, t, J=7.8Hz), 7.59-7.62(4H, m), 7.77(2H, d, J=8.8Hz), 7.99(1H, s), 8.16(1H, s)
	228 δ 2.39 (3H, s), 4.85 (2H, s), 7.11 (1H, br-s), 7.47-7.52 (2H, m), 7.58 (1H, s), 7.67-7.70 (2H, m), 7.73 (1H, s), 8.06 (1H, s)
30	229 (DMSO-d ₆) δ 4.86(2H, s), 7.45(1H, t, J=7.8Hz), 7.72(1H, s), 7.73(1H, d, J=7.8Hz), 7.83-7.84(2H, m), 8.14(1H, s), 9.27(1H, s), 9.34(1H, s)
	230 (DMSO-d ₆) δ 4.86(2H, s), 7.44(1H, t, J=8.1Hz), 7.67(1H, s), 7.68(1H, s), 7.71-7.74(1H, m), 7.85 (1H, d, J=7.3Hz), 8.15(1H, s), 9.31(1H, s), 9.41(1H, br-s)
35	231 (DMSO-d ₆) δ 4.96(2H, s), 7.51(1H, t, J=7.8Hz), 7.65-7.73(2H, m), 8.13(1H, s), 8.15(1H, s), 8.49 (1H, s), 10.41(1H, s), 10.58(1H, s)

Table 9(13)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
40	232 (DMSO-d ₆) δ 4.86(2H, s), 7.45(1H, t, J=7.8Hz), 7.70(1H, d, J=7.8Hz), 7.88(1H, d, J=7.8Hz), 7.94 (1H, s), 8.08(1H, s), 8.16(1H, s), 9.33(1H, s), 9.42(1H, s)
	233 δ 2.34(6H, s), 4.85(2H, s), 7.10(1H, br), 7.34(2H, s), 7.47-7.51(2H, m), 7.65-7.68(2H, m), 8.06(1H, s)
45	234 δ 2.34(6H, s), 4.85(2H, s), 7.10(1H, br), 7.35(2H, s), 7.47-7.52(2H, m), 7.65-7.68(2H, m), 8.05(1H, s)
	235 δ 4.84(2H, s), 7.17(1H, br-s), 7.49(1H, t, J=7.8Hz), 7.63(1H, d, J=7.8Hz), 7.67(1H, d, J=7.8Hz), 7.94(1H, s), 8.07(1H, s)
50	236 δ 4.85(2H, s), 7.14(1H, s), 7.51(1H, t, J=7.8Hz), 7.68-7.73(2H, m), 7.83(1H, s), 7.86(2H, s), 8.07 (1H, s)
	237 δ 2.48-2.60(2H, m), 4.43(2H, t, J=6.3Hz), 6.90(1H, s), 7.48(1H, t, J=7.8Hz), 7.63-7.69(2H, m), 7.86 (3H, s), 8.03(1H, s)
55	238 (DMSO-d ₆) δ 2.50-2.61(2H, m), 4.41(2H, t, J=6.3Hz), 7.43(1H, t, J=7.8Hz), 7.70(1H, d, J=7.8Hz), 7.71(1H, s), 7.80-7.84(2H, m), 8.06(1H, s), 8.82(1H, s), 9.26(1H, s)
	239 δ 1.34(3H, t, J=7.3Hz), 4.26(2H, q, J=7.3Hz), 6.77(1H, br-s), 7.46-7.53(2H, m), 7.70(1H, brd, J=7.3Hz), 7.86-7.94(3H, m), 8.39(1H, s), 8.71(1H, d, J=8.8Hz)

Table 9(15)

	Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
5	331	δ 2.29(6H, s), 4.85(2H, s), 7.11-7.19(3H, m), 7.39(1H, s), 7.49(1H, t, J=7.9Hz), 7.66-7.73(2H, m), 8.00 (1H, s)
	348	δ 2.35(6H, s), 3.81(3H, s), 6.80(1H, br), 7.36(2H, s), 7.44-7.63(4H, m), 8.02(1H, s)
10	377	δ 2.36(6H, s), 4.85(2H, s), 7.09(1H, s), 7.37(2H, s), 7.44(1H, s), 7.50(1H, t, J=8.3Hz), 7.67(2H, d, J=7.3Hz), 8.05 (1H, s)
	424	δ 4.85(2H, s), 7.10(1H, s), 7.51(1H, t, J=7.8Hz), 7.69-7.70(3H, m), 7.73(2H, s), 8.05(1H, s)
15	464	δ 2.47-2.59(2H, m), 4.41(2H, t, J=6.3Hz), 6.96(1H, br-s), 7.46(1H, t, J=7.8Hz), 7.63-7.67(2H, m), 7.83(1H, s), 7.91(2H, s), 8.00(1H, s)
	471	δ 4.85(2H, s), 7.13(1H, br-s), 7.50(1H, t, J=7.8Hz), 7.68-7.74(3H, m), 7.92(2H, s), 8.04(1H, s)
20	511	(DMSO-d ₆) δ 2.67-2.78(2H, m), 4.34(2H, t, J=5.9Hz), 7.50(1H, t, J=7.8Hz), 7.68-7.73(2H, m), 8.13 (1H, s), 8.52(2H, s), 10.02(1H, s), 10.77(1H, s)
	518	(DMSO-d ₆) δ 4.96(2H, s), 7.52(1H, t, J=7.8Hz), 7.71-7.75(2H, m), 8.16(1H, s), 8.51(2H, s), 10.42 (1H, s), 10.79(1H, s)
25	565	84.86(2H, s), 7.00(1H, br-s), 7.52(1H, t, J=8.3Hz), 7.70-7.73(3H, m), 7.93(2H, s), 8.06(1H, s)
	605	δ 2.49-2.60(2H, m), 4.43(2H, t, J=6.3Hz), 6.82(1H, s), 7.49(1H, t, J=7.8Hz), 7.66-7.68(3H, m), 7.94 (2H, s), 8.01(1H, s)
30	612	84.86(2H, s), 7.45(1H, t, J=7.8Hz), 7.72(1H, d, J=7.8Hz), 7.94(1H, br-s), 7.93(2H, s), 8.13(1H, s), 9.02(1H, s), 9.17(1H, s)
	659	84.86(2H, s), 7.06(1H, s), 7.51(1H, t, J=7.8Hz), 7.68-7.71(3H, m), 7.93(2H, s), 8.06(1H, s)
35	706	84.84(2H, s), 7.40(1H, br-s), 7.48(1H, t, J=7.8Hz), 7.67-7.75(2H, m), 8.00(1H, s), 8.09(2H, s), 8.24 (1H, s)
	770	δ 2.39(3H, s), 4.86(2H, s), 7.00(1H, br-s), 7.48-7.67(5H, m), 7.79(1H, s), 8.04(1H, s), 8.24(1H, d, J=8.8Hz)
35	800	δ 2.31(6H, s), 4.85(2H, s), 7.11(1H, br-s), 7.43(2H, s), 7.47-7.53(2H, m), 7.66(1H, s), 7.67(1H, s), 8.05(1H, s)

Table 9(16)

	Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
40	817	δ 0.89(3H, t, J=7.3Hz), 1.24-1.37(2H, m), 1.55-1.63(2H, m), 2.47-2.59(2H, m), 2.70(2H, t, J=7.8Hz), 4.42(2H, t, J=5.9Hz), 6.96(1H, br-s), 7.43-7.47(2H, m), 7.57(1H, d, J=1.5Hz), 7.62-7.64(2H, m), 7.74(1H, s), 8.00(1H, s)
	818	δ 0.86(3H, t, J=7.3Hz), 1.24-1.33(2H, m), 1.49-1.57(2H, m), 2.45-2.56(2H, m), 2.67(2H, t, J=7.8Hz), 4.38(2H, t, J=6.3Hz), 7.15(1H, s), 7.39(1H, t, J=7.8Hz), 7.48(1H, s), 7.62-7.64(2H, m), 7.88(1H, s), 7.93(1H, d, J=2.0Hz), 8.01(1H, s)
45	819	δ 0.81(3H, t, J=7.3Hz), 1.25(3H, d, J=6.8Hz), 1.53-1.64(2H, m), 2.49-2.60(2H, m), 2.92-3.01(1H, m), 4.43(2H, t, J=5.9Hz), 6.87(1H, br), 7.46-7.51(2H, m), 7.62-7.67(3H, m), 7.74(1H, d, J=1.5Hz), 8.01(1H, s)
	820	δ 1.32(6H,d,J=6.3Hz), 2.36(3H,s), 5.01-5.07(1H,m) 6.69(1H,s), 7.11-7.13(2H,m), 7.44(1H,t, J=8.3Hz), 7.55-7.59(2H,m), 7.68(1H,br-s), 7.95(1H,d,J=8.3Hz), 7.99(1H,s)
50	821	δ 1.27(6H, d, J=6.8Hz), 1.31(6H, d, J=6.3Hz), 2.96(1H, septet, J=6.8Hz), 5.05(1H, septet, J=6.3Hz), 6.79(1H, s), 7.42-7.52(4H, m), 7.72(1H, d, J=7.8Hz), 7.86(1H, t, J=2.0Hz), 8.14(1H, s), 8.21(1H, d, J=8.3Hz)

Table continued

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
5 841	δ1.31 (6H, d, J=7Hz), 2.34 (6H, s), 5.04 (1H, septet, J=7Hz), 6.73 (1H, s), 7.11 (2H, t, J=9Hz), 7.28 (2H, s), 7.42-7.63 (6H, m), 8.01 (1H, s)
10 842	δ1.24 (6H, d, J=6.8Hz), 1.31 (6H, d, J=6.3Hz), 2.32 (3H, s), 2.86 (1H, septet, J=6.8Hz), 5.03 (1H, septet, J=6.3Hz), 6.74 (1H, s), 7.08 (1H, s), 7.33 (1H, d, J=2.0Hz), 7.43 (1H, t, J=7.8Hz), 7.61-7.65 (3H, m), 7.96 (1H, s)
15 843	δ1.32 (6H, d, J=6.3Hz), 2.37 (3H, s), 5.03 (1H, septet, J=6.3Hz), 6.74 (1H, s), 7.46 (1H, t, J=7.8Hz), 7.51-7.57 (2H, m), 7.61-7.65 (2H, m), 7.90 (1H, s), 8.08 (1H, s)
20 844	δ 1.32(6H, d, J=6.3Hz), 2.35(3H, s), 5.03(1H, septet, J=6.3Hz), 6.72(1H, s), 7.09(1H, s), 7.21(1H, d, J=2.2Hz), 7.44(1H, t, J=8.1Hz), 7.52-7.61(3H, m), 8.02(1H, s)
845	δ 1.29(6H, d, J=6.8Hz), 1.31(6H, d, J=6.3Hz), 2.98(1H, septet, J=6.8Hz), 5.04(1H, septet, J=6.3Hz), 6.70(1H, s), 7.42-7.48(2H, m), 7.56-7.67(4H, m), 7.92(1H, s)
846	δ 1.32(6H, d, J=6.3Hz), 5.03(1H, septet, J=6.3Hz), 6.75(1H, br-s), 7.41-7.51(2H, m), 7.62-7.65 (1H, m), 7.91(1H, br-s), 8.08(1H, s)

Table 9(18)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
25 847	(DMSO-d ₆) δ 1.24-1.44(5H, m), 1.68-1.80(5H, m), 2.46-2.50(1H, m), 4.97(2H, s), 7.19(2H, d, J=8.8Hz), 7.47(1H, t, J=7.8Hz), 7.60-7.70(4H, m), 8.04(1H, s), 10.19(1H, s), 10.37(1H, s)
30 848	δ 4.84(2H, s), 7.29(1H, d, J=7.8Hz), 7.35(1H, br-s), 7.48(1H, t, J=7.8Hz), 7.56-7.67(3H, m), 7.75 (1H, d, J=7.3Hz), 7.97(1H, s), 8.23(1H, s), 8.37(1H, d, J=7.8Hz)
35 849	δ 4.85(2H, s), 7.12(1H, br-s), 7.47(1H, t, J=7.8Hz), 7.59-7.67(4H, m), 7.72-7.75(2H, m), 7.99(1H, s), 8.03(1H, s)
40 850	(DMSO-d ₆) δ 4.87(2H, s), 7.43(1H, t, J=7.8Hz), 7.65(1H, d, J=7.8Hz), 7.82(1H, d, J=7.8Hz), 7.96 (2H, d, J=8.8Hz), 8.07(1H, s), 8.18-8.22(2H, m), 9.66(1H, br), 10.51(1H, s)
45 851	δ4.85(2H, s), 6.67(1H, br-s), 7.47(1H, t, J=7.8Hz), 7.60-7.64(2H, m), 7.65(2H, d, J=8.8Hz), 7.74 (2H, d, J=8.8Hz), 7.98(1H, s), 8.00(1H, s)
50 852	δ4.86(2H, s), 7.09(1H, br-s), 7.48-7.53(1H, m), 7.61-7.65(2H, m), 7.81(2H, d, J=8.8Hz), 7.95(2H, d, J=8.8Hz), 7.95-8.04(1H, m), 8.14(1H, s)
55 854	δ0.90(3H, t, J=7.3Hz), 1.28-1.38(2H, m), 1.56-1.65(2H, m), 2.72(2H, t, J=7.8Hz), 4.85(2H, s), 7.14 (1H, br-s), 7.45(1H, s), 7.50(1H, t, J=7.8Hz), 7.58(1H, d, J=1.5Hz), 7.66-7.68(3H, m), 8.04(1H, s)
855	δ 0.88(3H, t, J=7.3Hz), 1.24-1.35(2H, m), 1.52-1.60(2H, m), 2.70(2H, t, J=7.8Hz), 4.84(2H, s), 7.27 (1H, s), 7.46-7.50(2H, m), 7.67-7.69(2H, m), 7.76(1H, s), 7.94(1H, d, J=1.5Hz), 8.06(1H, s)
856	δ 0.81(3H, t, J=7.3Hz), 1.25(3H, d, J=5.9Hz), 1.55-1.65(2H, m), 2.91-3.01(1H, m), 4.85(2H, s), 7.14(1H, br), 7.50-7.53(2H, m), 7.61-7.77(4H, m), 8.05(1H, s)
857	δ0.90(3H, t, J=7.3Hz), 1.31(3H, d, J=6.8Hz), 1.63-1.74(2H, m), 2.82-2.91(1H, m), 4.85(2H, s), 7.22 (1H, s), 7.47-7.53(3H, m), 7.58-7.62(1H, m), 7.66(1H, d, J=8.3Hz), 7.93(1H, s), 8.05(1H, s), 8.13-8.15(1H, m)
858	δ 2.36(3H,s), 4.85(2H,s), 7.11-7.14(3H,m), 7.49(1H,t,J=8.3Hz), 7.61-7.69(3H,m), 7.95(1H,d, J=8.3Hz), 8.02(1H,s)
859	δ 2.31 (3H, s), 4.34 (2H, q, J=7.8Hz), 4.84 (2H, s), 6.80-6.86 (2H, m), 7.16 (1H, br-s), 7.47 (1H, t, J=7.8Hz), 7.60-7.72 (4H, m), 7.99 (1H, br-s)
860	δ 2.39(3H,s), 4.85(2H,s), 7.09-8.14(9H,m)
861	δ 2.31(3H,s), 4.84(2H,s), 7.17(1H,br), 7.20-7.23(2H,m), 7.47(1H,t,J=8.1), 7.58-7.67(3H,m), 7.84-7.87(1H,m), 8.00(1H,s)
862	δ 1.27(6H, d, J=6.8Hz), 2.97(1H, septet, J=6.8Hz), 4.85(2H, s), 7.18(1H, br), 7.46-7.51(3H, m), 7.57(1H, dd, J=1.5Hz, 7.8Hz), 7.74(1H, d, J=7.8Hz), 7.94(1H, s), 8.14(1H, s), 8.21(1H, d, J=8.3Hz)

Table continued

Compound No.	¹ H-NMR(CDCl ₃ , ppm)
5	δ 2.33(6H, s), 3.86(3H, s), 4.85(2H, s), 6.96(2H, d, J=9Hz), 7.14(1H, br s), 7.30(2H, s), 7.47-7.53 (4H, m), 7.68(2H, d, J=7Hz), 8.02(1H, s)
	δ1.44 (3H, t, J=7Hz), 2.33 (6H, s), 4.08 (2H, q, J=7Hz), 4.85 (2H, s), 6.95 (2H, d, J=9Hz), 7.13 (1H, s), 7.30 (2H, s), 7.45-7.52 (4H, m), 7.68 (2H, d, J=7Hz), 8.01 (1H, s)
10	δ 2.33 (6H, s), 2.53 (3H, s), 4.84 (2H, s), 7.14 (1H, s), 7.30-7.38 (4H, m), 7.46-7.57 (4H, m), 7.67 (2H, d, J=6Hz), 8.02(1H, s)
	δ 2.34 (6H, s), 4.85(2H, s), 7.10-7.34 (6H, m), 7.41-7.52 (3H, m), 7.68 (2H, d, J=8Hz), 8.02 (1H, s)
15	δ 2.34(6H, s), 4.85(2H, s), 7.01-7.06(1H, m), 7.16(1H, br s), 7.25-7.50(8H, m), 7.68(1H, d, J=8Hz), 8.03(1H, s)
	δ 2.33 (6H, s), 4.85 (2H, s), 7.09-7.15 (3H, m), 7.29 (2H, s), 7.46-7.55 (4H, m), 7.67-7.69 (2H, m), 8.03 (1H, s)
20	δ 2.34(6H, s), 4.85(2H, s), 7.09(1H, br s), 7.18-7.30(4H, m), 7.34-7.51(3H, m), 7.67-7.69(2H, m), 8.04(1H, s)
	δ 2.30(9H, s), 4.85(2H, s), 7.05(1H, t, J=8.8Hz), 7.14(1H, br s), 7.28(2H, s), 7.32-7.51(4H, m), 7.67-7.69(2H, m), 8.03(1H, s)

Table 9(21)

Compound No.	¹ H-NMR (CDCl ₃ , ppm)
25	δ 2.31(6H, s), 4.85(2H, s), 6.69(1H, s), 7.09(1H, br-s), 7.25(2H, s), 7.41(1H, s), 7.47-7.51(2H, m), 7.66-7.68(2H, m), 7.72(1H, s), 8.02(1H, s)
	δ 2.30(6H, s), 4.84(2H, s), 7.07-7.09(1H, m), 7.25(1H), 7.27-7.29(1H, m), 7.36(2H, s), 7.36(2H, s), 7.45-7.50(2H, m), 7.65-7.67(2H, m), 8.02(1H, s)
30	δ 2.32(6H, s), 4.85(2H, s), 7.18(1H, s), 7.35-7.50(7H, m), 7.67(2H, d, J=6.8Hz), 8.02(1H, s)
	δ 2.31(3H, s), 4.85(2H, s), 7.10(1H, br), 7.20(1H, d, J=2.2Hz), 7.32(1H, d, J=2.2Hz), 7.49(1H, t, J=7.8Hz), 7.57(1H, s), 7.66-7.68(2H, m), 8.02(1H, s)
35	δ 2.31(2H, s), 4.85(2H, s), 7.44(1H, t, J=7.8Hz), 7.63-7.68(2H, m), 7.72(1H, d, J=2.4Hz), 7.84(1H, s), 8.06(1H, s), 8.80(1H, s), 9.09(1H, s)
	δ 4.85(2H, s), 7.00(1H, br-s), 7.51(1H, t, J=8.3Hz), 7.69-7.72(5H, m), 8.05(1H, s)
40	δ 4.86(2H, s), 7.00(1H, br-s), 7.53(1H, t, J=7.8Hz), 7.67-7.73(2H, m), 7.92(1H, s), 8.05(2H, s), 8.11 (1H, s)
	(DMSO-d ₆) δ 4.98(2H, s), 7.52(1H, t, J=7.8Hz), 7.70-7.75(2H, m), 8.17(1H, s), 8.31(2H, s), 10.42 (1H, s), 10.63(1H, s)
45	(DMSO-d ₆) δ 1.24-1.47(5H, m), 1.66-1.80(5H, m), 2.54-2.60(1H, m), 4.96(2H, s), 7.48(1H, t, J = 7.8Hz), 7.60(2H, s), 7.67-7.71(2H, m), 8.11(1H, s), 10.24(1H, s), 10.37(1H, s)
	(DMSO-d ₆) δ 4.86(2H, s), 7.44(1H, t, J=7.8Hz), 7.67(1H, d, J=7.8Hz), 7.82(1H, d, J=2.0Hz), 7.85 (1H, s), 8.05(1H, d, J=2.0Hz), 8.06(1H, d, J=7.8Hz), 9.04(1H, s), 9.27(1H, s)
50	δ 4.86(2H, s), 7.00(1H, br-s), 7.51(1H, t, J=7.8Hz), 7.70(2H, d, J=7.8Hz), 7.75(1H, s), 7.94(2H, s), 8.06(1H, s)
	δ 2.20(3H,s), 4.85(2H,s), 6.60(1H,d,J=2.4Hz), 7.17(1H,br.), 7.50(1H,t,J=7.8Hz), 7.54(1H,s), 7.59 (1H,s), 7.69(1H,d,J=7.8Hz), 7.72(1H,br), 8.03(1H,s)
55	δ 2.36(3H, s), 4.85(2H, s), 7.08(1H, br-s), 7.10(1H, s), 7.22-7.23(1H, m), 7.50(1H, t, J=8.1Hz), 7.59 (1H, s), 7.67-7.69(2H, m), 8.04(1H, s)

Table 9 (23)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
5 923	δ1.31 (6H, d, J=6.4Hz), 3.83 (3H, s), 5.02 (1H, septet, J=6.4Hz), 6.55 (1H, s), 6.78 (1H, br-s), 7.41-7.50 (2H, m), 7.57 (1H, d, J=7.8Hz), 8.03 (1H, br-s), 8.08 (1H, br-s)
10 924	δ1.32 (6H, d, J=6.3Hz), 3.86 (3H, s), 5.04 (1H, septet, J=6.3Hz), 6.72 (1H, br-s), 7.45-7.53 (2H, m), 7.63 (1H, d, J=7.3Hz), 7.80 (1H, br-s), 8.14 (1H, br-s)
15 925	δ1.32 (6H, d, J=5.9Hz), 3.89 (3H, s), 5.04 (1H, septet, J=5.9Hz), 6.72 (1H, s), 7.47-7.50 (2H, m), 7.70 (1H, d, J=8.3Hz), 7.90 (1H, br-s), 8.14 (1H, br-s)
20 926	δ1.32 (6H, d, J=6.1Hz), 3.88 (3H, s), 3.93 (3H, s), 5.04 (1H, septet), 6.78 (1H, br-s), 7.47 (1H, br-s), 7.64-7.68 (2H, m), 8.05 (1H, br-s), 9.40 (1H, br-s)
25 927	δ1.33 (6H, d, J=5.9Hz), 2.34 (3H, s), 5.02 (1H, septet, J=5.9Hz), 6.74 (1H, br-s), 7.24 (1H, s), 7.44 (1H, t, J=7.8Hz), 7.49-7.52 (1H, m), 7.58-7.60 (1H, m), 7.82 (1H, br-s), 8.07 (1H, br-s), 8.71 (1H, s)
30 928	δ1.31 (6H, d, J=6.4Hz), 2.35 (3H, s), 5.01-5.07 (1H, m), 6.74 (1H, br-s), 7.25 (1H, s), 7.46 (1H, t, J=7.8Hz), 7.58-7.63 (2H, m), 7.68 (1H, br-s), 8.07 (1H, br-s)
35 929	δ1.32 (6H, d, J=5.9Hz), 5.03 (1H, septet, J=5.9Hz), 6.52 (1H, septet, J=6.3Hz), 6.71 (1H, br-s), 6.99 (1H, d, J=8.8Hz), 7.43 (1H, t, J=7.8Hz), 7.51-7.58 (2H, m), 7.92 (1H, br-s), 8.01 (1H, br-s), 8.14 (1H, dd, J=8.8Hz, 2.4Hz), 8.34 (1H, d, J=2.4Hz)
40 930	δ1.32 (6H, d, J=5.9Hz), 2.33 (3H, s), 5.50 (1H, septet, J=5.9Hz), 6.53 (1H, septet, J=6.4Hz), 6.74 (1H, br-s), 6.87 (1H, s), 7.43 (1H, t, J=7.8Hz), 7.54-7.58 (2H, m), 7.64 (1H, br-s), 8.04 (1H, br-s), 8.37 (1H, s)
45 931	δ1.32 (6H, d, J=6.3Hz), 5.05 (1H, septet, J=6.3Hz), 6.30 (1H, septet, J=6.3Hz), 6.69 (1H, br-s), 7.01 (1H, d, J=8.8Hz), 7.47 (1H, t, J=7.8Hz), 7.56 (1H, dd, J=7.8Hz, 1.5Hz), 7.68 (1H, d, J=7.8Hz), 7.98 (1H, br-s), 8.27 (1H, br-s), 8.82 (1H, d, J=8.8Hz)
50 932	δ1.32 (6H, d, J=6.4Hz), 2.29 (3H, s), 2.41 (3H, s), 5.04 (1H, septet, J=6.4Hz), 6.58 (1H, septet, J=6.4Hz), 6.72 (2H, s), 7.37-7.46 (2H, m), 7.53-7.57 (1H, m), 7.60 (1H, d, J=7.8Hz), 8.05 (1H, br-s)
55 933	δ2.49 (3H, s), 4.85 (2H, s), 7.16 (1H, br-s), 7.48-7.57 (3H, s), 7.70 (2H, s), 7.76 (1H, d, J=7.6Hz), 7.92 (1H, s), 8.00 (1H, dd, J=3.4Hz, 6.8Hz), 8.13 (1H, s), 8.47 (1H, dd, J=3.4Hz, 6.8Hz)
60 934	δ1.75-1.79 (2H, m), 1.84-1.87 (2H, m), 2.74 (2H, t, J=6.4Hz), 3.02 (2H, q, J=6.4Hz), 4.85 (2H, s), 7.13 (1H, br-s), 7.41-7.51 (2H, m), 7.59-7.69 (2H, m), 7.76 (1H, br-s), 8.00 (1H, br-s), 8.06 (1H, br-d, J=8.5Hz)
65 935	δ1.65-1.76 (4H, m), 2.81 (2H, t, J=6.1Hz), 2.99 (2H, q, J=6.4Hz), 4.85 (2H, s), 7.10 (1H, br-s), 7.48-7.52 (2H, m), 7.59 (1H, s), 7.67-7.69 (2H, m), 8.04 (1H, s)
70 936	δ3.86 (3H, s), 4.85 (2H, s), 6.58 (1H, s), 7.10 (1H, br-s), 7.51 (1H, t, J=7.8Hz), 7.60 (1H, d, J=7.8Hz), 7.65 (1H, d, J=7.8Hz), 7.84 (1H, br-s), 8.10 (1H, br-s)
75 937	δ3.85 (3H, s), 4.85 (2H, s), 7.16 (1H, br-s), 7.51 (1H, t, J=7.9Hz), 7.62 (1H, d, J=7.9Hz), 7.68 (1H, d, J=7.9Hz), 7.85 (1H, br-s), 8.12 (1H, br-s)

Table 9(24)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
50 938	δ3.87 (3H, s), 4.85 (2H, s), 7.21 (1H, br-s), 7.51 (1H, t, J=8.3Hz), 7.61 (1H, d, J=8.3Hz), 7.68 (1H, d, J=8.3Hz), 7.92 (1H, br-s), 8.13 (1H, br-s)
55 939	δ3.89 (3H, s), 3.94 (3H, s), 4.86 (2H, s), 7.20 (1H, br-s), 7.52 (1H, t, J=7.8Hz), 7.70-7.73 (2H, m), 8.09 (1H, br-s), 9.44 (1H, s)
60 940	δ4.87 (2H, s), 7.07-7.11 (2H, m), 7.31-7.34 (1H, m), 7.47-7.52 (2H, m), 7.67-7.69 (1H, m), 8.01 (1H, dd, J=8.0Hz, 1.4Hz), 8.19 (1H, br-s), 8.58-8.60 (1H, m), 11.3 (1H, br-s)
65 941	δ4.84 (2H, s), 7.19 (1H, br-s), 7.33 (1H, dd, J=8.3Hz, 4.8Hz), 7.44 (1H, t, J=8.3Hz), 7.58-7.59 (2H, m), 7.94-7.97 (2H, m), 8.44 (1H, dd, J=4.8Hz, 1.4Hz), 9.14 (1H, br-s)

Table continued

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
1368	δ 0.93(3H, t, J=7.3Hz), 1.59-1.69(2H, m), 2.71(2H, t, J=7.8Hz), 4.86(2H, s), 7.11(1H, br), 7.49-7.54(2H, m), 7.62(1H, s), 7.69-7.72(2H, m), 7.96(1H, d, J=1.5Hz), 8.07(1H, s)
1385	δ 2.35(3H, s), 2.44(3H, s), 4.86(2H, s), 6.74(1H, s), 7.34-7.38(3H, m), 7.46(1H, s), 7.52(1H, d, J=8.8Hz), 7.89(1H, s), 8.35(1H, d, J=8.8Hz)
1386	δ 1.32(6H, d, J=6.3Hz), 2.40(6H, s), 2.41(3H, s), 5.03(1H, septet, J=6.3Hz), 6.46(1H, br-s), 7.15(1H, s), 7.28-7.37(4H, m), 7.95(1H, d, J=8.3Hz)
1387	δ 2.40(6H, s), 2.45(3H, s), 4.86(2H, s), 6.80(1H, br), 7.16(1H, s), 7.32-7.42(4H, m), 7.85(1H, br)
1388	δ 1.35(3H, t, J=7.3Hz), 2.36(6H, s), 4.28(2H, q, J=7.3Hz), 6.91 (1H, s), 7.29 (1H, t, J=8.3Hz), 7.37(2H, s), 7.74-7.79 (2H, m), 8.32 (1H, br-d, J=5.9Hz)
1389	δ 1.34 (6H, d, J=6.3Hz), 2.36 (6H, s), 5.07 (1H, septet, J=6.3Hz), 6.86 (1H, br-s), 7.30 (1H, t, J=8.1Hz), 7.37 (2H, s), 7.72-7.79 (2H, m), 8.32 (1H, br)

Table 9 (26)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
1408	δ 2.37(6H, s), 4.70(4H, dt, J=2.0Hz, 46.8Hz), 5.28(1H, tt, J=4.4Hz, 24.9Hz), 7.08(1H, br-s), 7.33(1H, t, J=8.3Hz), 7.37(2H, s), 7.76(1H, d, J=12.2Hz), 7.81(1H, dt, J=1.4Hz, 7.8Hz), 8.29(1H, br-s)
1411	δ 2.37(6H, s), 2.51-2.62(2H, m), 4.46(2H, t, J=6.4Hz), 6.97(1H, br-s), 7.32(1H, t, J=8.3Hz), 7.37(2H, s), 7.74-7.82(2H, m), 8.28(1H, br-s)
1416	δ 2.37(6H, s), 3.76-3.79(2H, m), 4.49(2H, t, J=5.4Hz), 7.02(1H, br), 7.32(1H, t, J=7.8Hz), 7.37(2H, s), 7.74-7.81(2H, m), 8.30(1H, br)
1418	δ 2.37 (6H, s), 4.88 (2H, s), 7.21 (1H, br), 7.32-7.37 (3H, m), 7.76-7.85 (2H, m), 8.31 (1H, br)
1421	δ 2.36(6H, s), 3.60(2H, t, J=5.9Hz), 4.54(2H, t, J=5.9Hz), 7.03(1H, br), 7.32(1H, t, J=7.8Hz), 7.37(2H, s), 7.76-7.81(2H, m), 8.29(1H, br)
1435	δ 1.35(3H, t, J=7.3Hz), 2.36(6H, s), 4.29(2H, q, J=7.3Hz), 6.89(1H, br-s), 7.30(1H, t, J=7.8Hz), 7.35(2H, s), 7.74-7.78(2H, m), 8.32(1H, br-s)
1455	δ 2.33(6H, s), 4.70(4H, ddd, J=48.8Hz, 2.4Hz, 4.3Hz), 5.28(1H, tt, J=20.0, 4.3Hz), 7.08(1H, br-s), 7.32(1H, d, J=8.3Hz), 7.35(2H, s), 7.75-7.83(2H, m), 8.29(1H, br-s)
1458	δ 2.36(6H, s), 2.51-2.62(2H, m), 4.47(2H, t, J=6.3Hz), 6.95(1H, br-s), 7.32(1H, t, J=7.3Hz), 7.35(2H, s), 7.74-7.82(2H, m), 8.29(1H, br-s)
1463	δ 2.36(6H, s), 3.77(2H, t, J=5.4Hz), 4.49(2H, t, J=5.4Hz), 7.03(1H, br), 7.31(1H, t, J=8.3Hz), 7.35(2H, s), 7.76-7.80(2H, m), 8.29(1H, br)
1465	δ 2.36(6H, s), 4.88(2H, s), 7.18(1H, br), 7.35(1H, t, J=8.3Hz), 7.36(2H, s), 7.75-7.85(2H, m), 8.31(1H, br)
1898	δ 1.33(6H, d, J=6.3Hz), 2.37(3H, s), 5.05(1H, septet, J=6.3Hz), 7.21(1H, br-s), 7.32(1H, d, J=6.6Hz), 7.39(1H, t, J=8.1Hz), 7.46(1H, s), 7.50-7.53(2H, m), 8.30-8.36(2H, m)
1899	δ 2.38(3H, s), 4.87(2H, s), 7.40-7.51(5H, m), 7.62(1H, s), 8.27-8.30(2H, m)
1900	δ 1.34(6H, d, J=6.1Hz), 2.41(6H, s), 5.05(1H, septet, J=6.1Hz), 7.22-7.26(2H, m), 7.31-7.40(4H, m), 8.33(1H, dd, J=1.5Hz, 8.1Hz)
1901	δ 2.40(6H, s), 4.88(2H, s), 7.29(1H, s), 7.37(2H, s), 7.38-7.43(2H, m), 7.50(1H, s), 8.28(1H, d, J=6.8Hz)
1902	δ 4.88(2H, s), 7.39(1H, dd, J=1.5Hz, 7.3Hz), 7.44-7.51(2H, m), 7.88-7.92(2H, m), 8.03(1H, s), 8.36(1H, d, J=8.3Hz), 8.70(1H, d, J=8.3Hz)

Table continued

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
5 1922	δ 2.35(6H, s), 4.88(2H, s), 7.36(2H, s), 7.50(1H, br), 7.53-7.59(2H, m), 7.70(1H, dd, J=2.0Hz, 8.3Hz), 8.72(1H, s)
	δ 2.35(6H, s), 2.45(3H, s), 4.84(2H, s), 7.00(1H, br), 7.36(2H, s), 7.41(1H, s), 7.48(2H, s), 7.83(1H, s)
10 1924	δ 1.33(6H, d, J=6.1Hz), 2.46(3H, s), 5.05(1H, septet, J=6.1Hz), 6.89(1H, br-s), 7.48(1H, s), 7.51(1H, d, J=9.1Hz), 7.79(2H, s), 7.89(1H, s), 8.18(1H, d, J=9.1Hz), 8.19(1H, s)
	δ 2.93(3H, s), 4.86(2H, s), 7.31(1H, br-s), 7.49(1H, s), 7.52(1H, d, J=8.8Hz), 7.78(1H, s), 7.85(1H, s), 7.94(1H, s), 8.18(1H, d, J=8.8Hz), 8.24(1H, s)
15 1926	δ 1.32(6H, d, J=6.1Hz), 2.34(6H, s), 5.04(1H, septet, J=6.1Hz), 6.87(1H, s), 7.36(2H, s), 7.50(1H, s), 7.83(1H, s), 7.90(1H, s), 8.20(1H, s)
	δ 2.35(6H, s), 4.86(2H, s), 7.26(1H, s), 7.37(2H, s), 7.48(1H, s), 7.89(1H, s), 7.97(1H, s), 8.24(1H, s)
20 1928	δ 1.31(6H, d, J=6.3Hz), 2.33(6H, s), 3.89(2H, br.), 4.97-5.04(1H, m), 6.59(1H, s), 6.92(1H, s), 7.02(1H, s), 7.23-7.26(1H, m), 7.34(2H, s), 7.39(1H, br)
	δ 2.35(6H, s), 3.04(6H, s), 4.84(2H, s), 6.94(2H, br), 7.04(1H, s), 7.30(1H, s), 7.349(2H, s), 7.404(1H, s)
25 1930	δ 1.30(6H, d, J=6.3Hz), 2.37(3H, s), 2.48(3H, s), 5.02(1H, septet, J=6.3Hz), 6.57(1H, s), 7.20-7.28(2H, m), 7.44(2H, s), 7.50(1H, d, J=8.3Hz), 7.76(1H, s), 8.28(1H, d, J=9.1Hz)
	δ 2.39(3H, s), 2.48(3H, s), 4.84(2H, s), 7.22(1H, d, J=8.3Hz), 7.44-7.54(3H, m), 7.80(1H, s), 8.13(1H, d, J=8.1Hz), 8.20(1H, s), 9.04(1H, s)
30 1932	δ 1.30(6H, d, J=6.1Hz), 2.39(6H, s), 2.48(3H, s), 5.02(1H, septet, J=6.1Hz), 6.63(1H, s), 7.19-7.25(3H, m), 7.36(2H, s), 7.81(1H, s)

Table 9(29)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
35 1933	δ 2.40(6H, s), 2.50(3H, s), 4.84(2H, s), 7.01(1H, br-s), 7.18(1H, s), 7.24-7.27(1H, m), 7.31-7.34(1H, m), 7.37(2H, s), 7.82(1H, s).
	δ 1.31(6H, d, J=6.1Hz), 2.41(3H, s), 5.04(1H, septet, J=6.1Hz), 6.69(1H, s), 7.16-7.21(1H, m), 7.46(1H, s), 7.5(1H, d, J=8.8Hz), 7.88(1H, dd, J=2.9Hz, 6.6Hz), 7.96(1H, br), 8.40(1H, d, J=8.8Hz), 8.57(1H, d, J=17.6Hz)
40 1935	δ 2.92(3H, s), 4.84(2H, s), 7.04(1H, br), 7.20-7.27(1H, m), 7.46(1H, s), 7.51(1H, d, J=8.5Hz), 7.94(1H, br), 8.01(1H, dd, J=2.9Hz, 6.6Hz), 8.40(1H, d, J=8.5Hz), 8.57(1H, br-d, J=17.6Hz)
	δ 1.31(6H, d, J=6.3Hz), 2.35(6H, s), 5.02(1H, septet, J=6.3Hz), 6.70(1H, s), 7.19(1H, dd, J=9.0Hz, 11.2Hz), 7.36(2H, s), 7.83(1H, dd, J=2.9Hz, 6.6Hz), 7.99(1H, br), 8.01(1H, d, J=5.1Hz)
45 1937	δ 2.36(6H, s), 4.84(2H, s), 7.10(1H, br-s), 7.21-7.26(1H, m), 7.36(2H, s), 7.94-8.03(3H, m)
	δ 1.31(6H, d, J=6.3Hz), 2.41(3H, s), 5.03(1H, septet, J=6.3Hz), 6.68(1H, s), 7.40(1H, d, J=8.8Hz), 7.46(1H, s), 7.51(1H, d, J=8.5Hz), 7.67(1H, d, J=8.5Hz), 7.78(1H, d, J=2.7Hz), 8.06(1H, s), 8.32(1H, d, J=8.8Hz)
50 1939	δ 2.92(3H, s), 4.84(2H, s), 7.38(1H, d, J=8.8Hz), 7.45-7.49(2H, m), 7.72(1H, d, J=7.3Hz), 7.93(1H, s), 8.17(1H, d, J=8.5Hz), 8.52(1H, s), 9.43(1H, s)
	δ 1.31(6H, d, J=6.1Hz), 2.40(6H, s), 5.03(1H, septet, J=6.1Hz), 6.70(1H, s), 7.36(2H, s), 7.41(1H, d, J=8.8Hz), 7.63-7.66(2H, m), 7.75(1H, d, J=2.7Hz)
55 1941	δ 2.90(6H, s), 4.84(2H, s), 7.08(1H, br), 7.37(2H, s), 7.46(1H, d, J=8.8Hz), 7.64-7.70(2H, m), 7.82(1H, d, J=2.7Hz)
	δ 1.31(6H, d, J=6.3Hz), 2.41(3H, s), 4.97-5.07(1H, m), 6.70(1H, s), 7.45-7.58(4H, m), 7.72-7.75(2H, m), 8.30(1H, d, J=8.8Hz)

Table 9(31)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
1967	δ 1.34 (6H, d, J=6.3Hz), 2.34 (6H, s), 5.09 (1H, septet, J=6.3Hz), 7.29 (1H, br-s), 7.35 (2H, s), 7.91 (1H, t, J=7.8Hz), 7.97 (1H, d, J=7.8Hz), 8.21 (1H, d, J=7.8Hz), 9.19 (1H, br-s)
1968	δ 2.35 (6H, s), 4.89 (2H, s), 7.36 (2H, s), 7.63 (1H, br-s), 7.97 (1H, dd, J=8.3Hz, 7.6Hz), 8.05 (1H, d, J=7.6Hz), 8.21 (1H, d, J=8.3Hz), 9.17 (1H, br-s)
1969	δ 2.35 (6H, s), 3.77-3.80 (2H, m), 4.48-4.52 (2H, m), 7.36 (2H, s), 7.46 (1H, br-s), 7.94 (1H, t, J=7.8Hz), 8.02 (1H, dd, J=7.8Hz, 1.0Hz), 8.19 (1H, dd, J=7.8Hz, 1.0Hz), 9.17 (1H, br-s)
2061	δ 1.36 (6H, d, J=6.4Hz), 2.52 (6H, s), 5.07-5.14 (1H, m), 7.36 (2H, s), 7.56 (1H, t, J=8.2Hz), 8.15 (1H, dd, J=8.2Hz, 1.9Hz), 8.44 (1H, dd, J=8.2Hz, 1.9Hz), 9.45 (1H, br-s), 12.9 (1H, br-s)
2062	δ 2.37 (6H, s), 4.91 (2H, s), 7.36 (2H, s), 7.61 (1H, t, J=8.3Hz), 8.23 (1H, dd, J=8.3Hz, 1.9Hz), 8.45 (1H, dd, J=8.3Hz, 1.9Hz), 9.81 (1H, br-s), 12.7 (1H, br-s)
2157	δ 2.36 (6H, s), 4.90 (2H, s), 7.38 (2H, s), 7.52-7.60 (2H, m), 8.44 (1H, s), 8.56 (1H, d, J=5.4Hz), 8.58 (1H, br-s)
2164	δ 1.33 (6H, d, J=5.8Hz), 2.35 (6H, s), 5.03-5.07 (1H, m), 7.06 (1H, s), 7.35 (2H, s), 7.93 (1H, d, J=2.4Hz), 7.95 (1H, d, J=5.9Hz, 2.4Hz), 8.49 (1H, d, J=5.9Hz), 9.58 (1H, br-s)
2165	(DMSO-d ₆) δ 2.26 (6H, s), 5.02 (2H, s), 7.43 (2H, s), 7.75 (1H, dd, J=5.4Hz, 2.0Hz), 8.31 (1H, d, J=2.0Hz), 8.60 (1H, d, J=5.4Hz), 10.41 (1H, br-s), 10.92 (1H, br-s)
2167	(DMSO-d ₆) δ 2.36 (6H, s), 4.90 (2H, s), 7.34 (2H, s), 7.94 (1H, dd, J=7.3Hz, 3.4Hz), 8.31 (1H, d, J=7.3Hz), 8.60 (1H, d, J=3.4Hz), 10.90 (1H, br-s), 13.65 (1H, br-s)
2168	(DMSO-d ₆) δ 2.30 (6H, s), 3.61 (3H, s), 5.03 (2H, s), 7.47 (2H, s), 7.92 (1H, d, J=7.6Hz), 7.98 (1H, d, J=7.6Hz), 8.08 (1H, t, J=7.6Hz), 10.18 (1H, s)

Table 9(32)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
I-1	δ 2.34 (6H, s), 3.87 (2H, br-s), 6.86-6.89 (1H, m), 7.21-7.30 (3H, m), 7.33 (2H, s), 7.39 (1H, s)
I-2	δ 3.87 (2H, br), 6.84-7.00 (1H, m), 7.14-7.17 (1H, m), 7.20 (1H, t, J=2.0Hz), 7.24-7.28 (1H, m), 7.60 (2H, d, J=8.8Hz), 7.78 (2H, d, J=8.8Hz), 7.90 (1H, br-s)
I-3	δ 2.51 (3H, d, J=8.8Hz), 3.86 (2H, br-s), 6.83-6.88 (1H, m), 7.13-7.25 (3H, m), 7.26-7.63 (3H, m), 7.90 (1H, br-s)
I-4	δ 3.87 (2H, br-s), 3.89 (3H, s), 6.86-6.88 (1H, m), 6.99 (1H, dd, J=8.6Hz, 2.0Hz), 7.15-7.20 (2H, m), 7.27 (1H, t, J=7.8Hz), 7.51 (1H, d, J=8.6Hz), 7.83 (1H, s), 7.93 (1H, s)
I-5	δ 3.89 (2H, br-s), 6.86-6.89 (1H, m), 7.12-7.30 (3H, m), 7.52-7.59 (2H, m), 7.76-7.93 (2H, m)
I-6	δ 2.43 (3H, s), 3.83 (2H, br), 6.85-6.88 (1H, m), 7.14-7.17 (1H, m), 7.21-7.29 (2H, m), 7.45 (1H, s), 7.49 (1H, d, J=8.8Hz), 7.76 (1H, br), 8.27 (1H, d, J=8.8Hz)
I-7	δ 2.34 (6H, s), 3.87 (2H, br), 6.86-6.89 (1H, m), 7.20-7.35 (6H, m)
I-8	δ 2.42 (3H, s), 3.79 (2H, br-s), 6.80 (1H, dd, J=2.2Hz, 7.8Hz), 6.90 (1H, d, J=7.8Hz), 7.05 (1H, s), 7.15 (1H, t, J=7.8Hz), 7.26-7.44 (7H, m), 7.53 (1H, s)
I-9	δ 2.33 (3H, s), 2.52 (3H, d, J=8.8Hz), 3.89 (2H, br-s), 6.86-6.89 (1H, m), 7.14-7.16 (1H, m), 7.22 (1H, s), 7.28-7.30 (2H, m), 7.65 (1H, br-s), 8.11 (1H, s)
I-10	δ 2.28 (3H, s), 2.46 (3H, d, J=6.1Hz), 3.88 (2H, br-s), 6.84-6.89 (1H, m), 7.15-7.19 (1H, m), 7.23-7.29 (2H, m), 7.41 (1H, d, J=9.1Hz), 7.73 (1H, br-s), 7.81 (1H, d, J=9.1Hz)
I-12	δ 2.60 (3H, s), 3.92 (2H, br-s), 6.89-6.92 (1H, m), 7.24-7.32 (3H, m), 7.46 (1H, s), 7.76 (1H, br-s)
I-13	δ 2.27 (6H, s), 3.31 (3H, s), 6.40-6.43 (1H, m), 6.54-6.58 (1H, m), 6.71 (1H, t, J=2.0Hz), 6.76-6.86 (1H, m), 7.22 (2H, s)

Table continued

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
5 I-33	δ 2.33(6H, s), 3.87(2H, br-s), 6.86-6.89(1H, m), 7.21-7.29(3H, m), 7.34(2H, s), 7.52(1H, s)
	δ 2.32(6H, s), 3.86(2H, br-s), 6.85-6.88(1H, m), 7.20-7.28(3H, m), 7.33(2H, s), 7.60(1H, s)
	δ 3.86(2H, br), 6.84-6.87(1H, m), 7.13-7.28(3H, m), 7.63-7.64(2H, m), 7.70-7.74(2H, m), 7.91(1H, br-s)
10 I-36	δ 3.99(2H, br-s), 6.85-6.88(1H, m), 7.23-7.34(3H, m), 7.91(2H, s), 8.69(1H, s)
	δ 3.91(2H, br), 6.88-6.91(1H, m), 7.15-7.21(2H, m), 7.29(1H, t, J=7.8Hz), 7.94-7.98(2H, m), 8.03(2H, d, J=8.8Hz), 8.11(1H, s)
	(DMSO-d ₆) δ 5.39(2H, br-s), 6.77-6.80(1H, m), 7.12-7.19(3H, m), 8.49(2H, s), 10.53(1H, s)
15 I-38	(DMSO-d ₆) δ 2.30(3H, s), 4.32(2H, br-s), 4.39(2H, q, J=8.3Hz), 6.79-6.86(3H, m), 7.18-7.27(2H, m), 7.45(1H, d, J=8.8Hz), 7.56(1H, s), 8.91 (1H, br-s)
	δ 3.87(2H, br-s), 6.85-6.88(1H, m), 7.14(1H, dd, J=9.3Hz, 1.0Hz), 7.19(1H, t, J=2.0Hz), 7.27(1H, t, J=7.9Hz), 7.64(2H, d, J=8.7Hz), 7.71(2H, d, J=8.7Hz), 7.86(1H, s)
	δ 3.88(2H, s), 6.90(1H, d, J=6.8Hz), 7.23-7.32(3H, m), 7.60(1H, s), 7.92(2H, s)
20 I-42	δ 3.89(2H, br-s), 6.90(1H, dt, J=2.5Hz, 6.3Hz), 7.25-7.32(3H, m), 7.59(1H, s), 7.72(2H, s)
	δ 3.89(2H, br-s), 6.90(1H, dt, J=2.5Hz, 6.4Hz), 7.28-7.30(3H, m), 7.60(1H, s), 7.93(2H, s)
	δ 3.92(2H, s), 6.92(1H, dt, J=1.5Hz, 7.3Hz), 7.23-7.30(3H, m), 7.79(1H, s), 8.04(2H, s)
25 I-46	δ 3.89(2H, br-s), 6.90(1H, dd, J=2.4Hz, 4.9Hz), 7.23-7.32(3H, m), 7.61(1H, s), 7.93(2H, s)
	δ 3.88(2H, br-s), 6.90(1H, d, J=6.3Hz), 7.23-7.32(3H, m), 7.62(1H, s), 7.92(2H, s)

Table 9(35)

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
30 I-48	δ 6.90-6.94(1H, m), 7.28-7.33(3H, m), 7.73(1H, s), 8.02(1H, s), 8.25(1H, s)
	δ 2.31(6H, s), 2.90(3H, s), 6.81(1H, dd, J=1.9Hz, 7.8Hz), 7.15-7.18(2H, m), 7.30(1H, t, J=7.8Hz), 7.42(1H, s), 7.52(2H, s)
	δ 2.91(3H, s), 6.82-6.85(1H, m), 7.21-7.23(2H, m), 7.32(1H, t, J=7.8Hz), 7.64(1H, s), 7.93(2H, s)
35 I-50	δ 2.29(3H,s), 2.34(3H,s), 3.82(2H,br), 6.81(1H,d,J=8.1Hz), 6.92(1H,d,J=8.1Hz), 7.11 (1H,t, J=7.8Hz), 7.41-7.44(2H,m), 7.50(1H,d,J=8.3Hz), 8.36(1H,d,J=8.3Hz)
	δ 2.23(3H, s), 2.39(3H, s), 3.82(2H, br), 7.10-7.16(2H, m), 7.24(1H, d, J=1.7Hz), 7.44(1H, s), 7.49 (1H, d, J=8.1Hz), 7.73(1H, s), 8.30(1H, d, J=8.8Hz)
	δ 2.34(3H, s), 2.40(3H, s), 3.70(2H, br), 6.72(1H, dd, J = 2.4Hz, 8.1Hz), 6.83(1H, d, J=2.4Hz), 7.07 (1H, d, J=8.1Hz), 7.36(1H, s), 7.44(1H, s), 7.50(1H, d, J=8.5Hz), 8.30(1H, d, J=8.5Hz)
40 I-53	δ 2.38(6H, s), 2.42(3H, s), 3.70(2H, br), 6.72(1H, dd, J=2.4Hz, 8.1Hz), 6.89(1H, d, J=2.4Hz), 7.05 (1H, s), 7.07(1H, d, J=8.1Hz), 7.36(2H, s)
	δ 2.37 (6H, s), 3.90 (2H, br-s), 6.96-7.01 (1H, m), 7.10 (1H, t, J=7.8Hz), 7.36 (2H, s), 7.43-7.47 (1H, m), 7.86 (1H, d, J=13.2Hz)
	δ 2.33(6H, s), 6.99(1H, dt, J=1.5Hz, 7.8Hz), 7.10(1H, t, J=7.8Hz), 7.43(2H, s), 7.46(1H, d, J=7.8Hz), 7.84(1H, d, J=13.2Hz)
50 I-60	δ 2.33(6H, s), 3.93(2H, s), 7.05-7.14(1H, m), 7.17-7.21(1H, m), 7.31(1H, s), 7.35(2H, s), 7.37-7.40 (1H, m)
	δ 2.40(3H, s), 3.77(2H, br), 6.79-6.83(1H, m), 6.97-7.03(1H, m), 7.44-7.51(3H, m), 8.42(1H, d, J=8.8Hz), 8.60(1H, br-d, J=18.8Hz)
55 I-62	

Table continued

Compound No.	¹ H-NMR(CDCl ₃ ,ppm)
I-83	δ 1.71-1.79 (4H, m), 2.81 (2H, t, J=6.1Hz), 2.99 (2H, q, J=6.3Hz), 3.87 (2H, br-s), 6.87-6.90 (1H, m), 7.24-7.29 (3H, m), 7.47-7.52 (2H, m)
I-84	δ 3.87 (2H, br-s), 6.51 (1H, septet, J=6.3Hz), 6.85-6.88 (1H, m), 6.99 (1H, d, J=8.7Hz), 7.15 (1H, d, J=7.3Hz), 7.20 (1H, t, J=2.0Hz), 7.25-7.29 (1H, m), 7.75 (1H, br-s), 8.15 (1H, dd, J=8.7Hz, 2.4Hz), 8.30 (1H, d, J=2.4Hz)
I-85	δ 2.37(3H, s), 4.27(2H, br-s), 6.55(1H, septet, J=6.3Hz), 6.88-6.91(2H, m), 7.06(1H, dd, J=7.3Hz, 1.5Hz), 7.18(1H, t, J=7.3Hz), 7.37(1H, br-s), 8.50(1H, br-s)
I-86	δ 2.37(3H, s), 3.88(2H, br-s), 6.34(1H, septet, J=6.3Hz), 6.88(1H, s), 6.89-6.91(1H, m), 7.23-7.31 (3H, m), 7.47(1H, br-s)

[0074] The insecticides containing the compounds represented by formula (1) of the present invention as active ingredients are suitable for preventing insect pests such agricultural, horticultural and stored grain insect pests which are noxious to paddy rice, fruit trees, vegetables, other crops and flowing plants, sanitary pests, or nematodes. For example, the insecticides have strong insecticidal activity on the following insect pests: Lepidoptera such as cotton caterpillar (*Diaphania indica*), oriental tea tortrix (*Homona magnanima*), cabbage webworm (*Hellula undalis*), summer fruit tortrix(*Adoxophyes orana fasciata*), smaller tea tortrix (*Adoxophyes sp.*), apple tortrix (*Archips fuscocupreanus*), peach fruit moth (*Carposina niponensis*), Manchurian fruit moth (*Grapholita inopinata*), oriental fruit moth (*Grapholita molesta*), soybean pod borer (*Leguminivora glycinivorella*), mulberry leafroller (*Olethreutes mori*), citrus leafminer (*Phyllocnistis citrella*), persimmon fruit moth (*Stathmopoda masinissa*), tea leafroller (*Caloptilia theivora*), *Caloptilia* sp. (*Caloptilia zachrysa*), apple leafminer (*Phyllonorycter ringoniella*), pear barkminer (*Spulerrina astaura*), small citrus dog (*Papilio xuthus*), common cabbage worm (*Pieris rapae crucivora*), tobacco budworm (*Heliothis armigera*), codling moth (*Lapsey resia pomonella*), diamondback moth (*Plutella xylostella*), apple fruit moth (*Argyresthia conjugella*), peach fruit moth (*Carposina niponensis*), rice stem borer (*Chilo suppressalis*), rice leafroller (*Cnaphalocrocis medinalis*), tobacco moth (*Ephesia elutella*), mulberry pyralid (*Glyphodes pyloalis*), paddy borer (*Scirpophaga incertulas*), rice skipper (*Parthena guttata*), rice armyworm (*Pseudaletia separata*), pink borer (*Sesamia inferens*), cabbage armyworm (*Mamestra brassicae*), common cutworm (*Spodoptera litura*), beet armyworm (*Spodoptera exigua*), black cutworm (*Agrotis ipsilon*), turnip moth (*Agrotis segetum*), beet semi-looper (*Autographa nigrisigna*), and cabbage looper (*Trichoplusia ni*); hemiptera such as aster leafHopper (*Macrosteles fascifrons*), green rice leafHopper (*Nephrotettix cincticeps*), brown rice planthopper (*Nilaparvata lugens*), small brown planthopper (*Laodelphax striatellus*), whitebacked rice planthopper (*Sogatella furcifera*), citrus psylla (*Diaphorina citri*), grape whitefly (*Aleurolobus taonabae*), silverleaf whitefly (*Bermisia argentifolii*), sweetpotato whitefly (*Bermisia tabaci*), greenHouse whitefly (*Trialeurodes vaporariorum*), turnip aphid (*Lipaphis erysimi*), cotton aphid (*Aphis gossypii*), apple aphid (*Aphis Citricola*), green peach aphid (*Myzus persicae*), Indian wax scale (*Ceroplastes ceriferus*), Comstock mealybug (*Pseudococcus Comstocki*), Japanese mealybug (*Planococcus kraunhiae*), cottony citrus scale (*Pulvinaria aurantii*), camphor scale (*Pseudaonidia duplex*), San Jose scale (*Comstockaspis perniciosa*), arrowHead scale (*Unaspis yanonensis*), brownwinged green bug (*Plautia Stali*), and brown marmorated stink bug (*Halyomorpha mista*); Coleoptera such as soybean beetle (*Anomala rufocuprea*), Japanese beetle (*Popillia japonica*), cigarette beetle (*Lasioderma serricorne*), powderpost beetle (*Lyctus brunneus*), twenty-eight-spotted ladybird (*Epilachna vigintioctopunctata*), adzuki bean weevil (*Callosobruchus chinensis*), vegetable weevil (*Listroderes costirostris*), maize weevil (*Sitophilus zeamais*), boll weevil (*Anthonomus gradis gradis*), rice water weevil (*Lissorhoptrus oryzophilus*), cucumber leaf beetle (*Aulacophora femoralis*), rice leaf beetle (*Oulema oryzae*), striped flea beetle (*Phyllotreta striolata*), pine shoot beetle (*Tomicus piniperda*), Colorado potato beetle (*Leptinotarsa decemlineata*), Mexican bean beetle (*Epilachna varivestis*), corn rootworm (*Diabrotica sp.*), yellowspotted longicorn beetle (*Psacothea hilaris*), and whitespotted longicorn beetle (*Anoplophora malasiaca*); Diptera such as melon fly (*Dacus(Bactrocera) dorsalis*), rice leafminer (*Agromyza oryzae*), onion maggot (*Delia antiqua*), seedcorn maggot (*Delia platura*), soybean pod gall midge (*Asphondylia sp.*), house fly (*Musca domestica*), garden pea leafminer (*Chromatomyia horticola*), legume leafminer (*Liriomyza trifolii*), bryony leafminer (*Liriomyza bryoniae*), and common house mosquito (*Culex pipiens pipiens*); Nematoda such as coffee root-lesion nematode (*Pratylenchus coffeae*), root-lesion nematode (*Pratylenchus sp.*), potato cyst nematode (*Globodera rostochiensis*), root-knot nematode (*Meloidogyne sp.*), citrus nematode (*Tylenchulus semipenetrans*), nematode (*Aphelenchus avenae*), and chrysanthemum foliar nematode (*Aphelenchoides ritzemabosi*); Thysanoptera such as melon thrips (*Thrips palmi*), western flowerthrips (*Frankliniella occidentalis*), yellow tea thrips (*Scirtothrips dorsalis*), honeysuckle thrips (*Thrips flavus*), and onion thrips (*Thrips tabaci*); Orthoptera such as German cockroach (*Blattella germanica*), American cockroach (*Periplaneta americana*), and rice grasshopper (*Oxya yezoensis*).

[0075] The insecticides containing the compounds represented by formula (1) of the present invention as active

formulation is 0.1% by weight to 20% by weight.

[0082] In order to prevent various noxious insects, the compound of the present invention is directly used or properly diluted with water or suspended in water, and an effective amount thereof for preventing pests is applied to crops in which the breeding of the noxious insects is predicted, or a place where the breeding of the noxious insects is undesirable.

5 The amount of the compound used depends upon the various factors, for example, the purpose, the object insects, the growth conditions of crops, the breeding tendency of insects, weather, environmental conditions, formulations, application methods, application places, and application times. However, the content of the active ingredient used is generally 0.0001 ppm to 5000 ppm, and preferably 0.01 ppm to 1000 ppm. The amount of the active ingredient per 10a is generally 1 g to 300 g.

10 [0083] An insecticide containing as an active ingredient the compounds represented by formula (1) of the present invention may be singly used for preventing insect pests such agricultural, horticultural or stored grain insect pests which are noxious to paddy rice, fruit trees, vegetables, other crops and flowering plants, sanitary pests, or nematodes. In order to further obtain an excellent preventive effect on various noxious insects which simultaneously occur, at least one of other insecticides and/or fungicides may be combined with the compounds represented by formula (1) of the 15 present invention.

20 [0084] Examples of such insecticides which can be combined with the compounds represented by formula (1) of the present invention include synthetic pyrethroid insecticides such as allethrin, tetramethrin, resmethrin, phenothrin, furamethrin, permethrin, cypermethrin, deltamethrin, cyhalothrin, cyfluthrin, fenpropathrin, tralomethrin, cycloprothrin, flucythrinate, fluvalinate, acrinathrin, tefluthrin, bifenthrin, empenthrin, beta-cyfluthrin, zeta-cypermethrin, and fenvalerate, and 25 various isomers thereof and pyrethrum extracts; organophosphate insecticides such as DDVP, cyanophos, fenthion, fenitrothion, tetrachlorvinphos, dimethylvinphos, propaphos, methylparathion, temephos, phoxim, acephate, isofenphos, salithion, DEP, EPN, ethion, mecarbam, pyridafenthion, diazinon, pirimiphos-methyl, etrimfos, isoxathion, quinalphos, chlorpyrifos-methyl, chlorpyrifos, phosalone, phosmet, methidathion, oxydeprofos, vamidothion, malathion, phentoate, dimethoate, formothion, thiometon, ethylthiometon, phorate, terbufos, profenos, prothifos, sulprofos, pyraclofos, 30 monocrotophos, naled, fosthiazate, and cadusafos; carbamate insecticides such as NAC, MTMC, MIPC, BPMC, XMC, PHC, MPMC, ethiofencarb, bendiocarb, pirimicarb, carbosulfan, benfuracarb, methomyl, oxamyl, and aldicarb; arylpropylether insecticides such as etofenprox and halfenprox; silylether insecticides such as silafluofen; insecticidal natural products such as nicotine-sulfate, polynactin complex, abamectin, milbemectin, and BT agents; insecticides such as, 35 cartap, thiocyclam, bensultap, diflubenzuron, chlorfluazuron, teflubenzuron, triflumuron, flufenoxuron, flucycloxuron, hexaflumuron, fluazuron, imidacloprid, nitenpyram, acetamiprid, dinotefuran, pymetrozine, fipronil, buprofezin, fenoxy-carb, pyriproxyfen, methoprene, hydroprene, kinoprene, diafenthiuron, triazamate, tebufenozone, and endosulfan; aca-ricides such as dicofol, chlorobenzilate, bromopropylate, tetradifon, CPCBS, BPPS, chinomethionate, amitraz, benzox-imate, hexythiazox, fenbutatin oxide, cyhexatin, dienochlor, clofentezine, pyridaben, fenpyroximate, fenazaquin, and 40 tebufenpyrad; and other insecticides such as novaluron, noviflumuron, emamectin benzoate, clothianidin, thiacloprid, thiamethoxam, flupyrazofos, acequinocyl, bifenazate, chromafenozide, etoxazole, fluacrypyrim, flufenazine, halozenozone, indoxacarb, methoxyfenozide, spirodiclofen, tolfenpyrad, gamma-cyhalothrin, ethiprole, amidoflumet, bistrifluron, floni-camid, flubrocythrinate, flufenerim, pyridalyl, pyrimidifen, spinosad, and spiromesifen.

45 [0085] Examples of fungicides which can be combined with the compounds represented by formula (1) of the present invention include azole fungicides such as triadimefon, hexaconazole, propiconazole, ipconazole, prochloraz, and triflumizole; pyrimidine fungicides such as pyrifenox and fenarimol; anilinopyrimidine fungicides such as mepanipyrim and cyprodinil; acylalanine fungicides such as metalaxyl, oxadixyl, and benalaxylyl; benzimidazole fungicides such as thiophanate-methyl and benomyl; dithiocarbamate fungicides such as mancozeb, propineb, zineb, and metiram; organochlorine fungicides such as tetrachloroisophthalonitrile; carboxamide fungicides such as carpropamid and ethaboxam; morpholine fungicides such as dimethomorph; strobilurin fungicides such as azoxystrobin, kresoxim-methyl, metomi-nostrobin, orysastrobin, fluoxastrobin, trifloxystrobin, dimoxystrobin, pyraclostrobin, and picoxystrobin; dicarboxyimide fungicides such as iprodione and procymidone; soil-applied fungicides such as flusulfamide, dazomet, methyl isothiocyanate, and chloropicrin; copper fungicides such as basic copper chloride, basic copper sulfate, copper nonylphenol sulfonate, oxine-copper, and DBEDC; inorganic fungicides such as sulfur and zinc sulfate; organophosphate fungicides such as edifenphos, tolclofos-methyl, and fosetyl-aluminum; melanin biosynthesis inhibitors such as phthalide, tricyclo-zole, pyroquilon, and dicloctymet; antibiotics such as kasugamycin, validamycin, and polyoxins; fungicidal natural products such as rape seed oil; and other fungicides such as benthiavalicarbisopropyl, iprovalicarb, cyflufenamid, fenhexamid, quinoxyfen, spiroxamine, diflumetorim, metrafenone, picobenzamid, proquinazid, silthifam, oxypoconazole, famoxa-done, cyazofamid, fenamidone, furametpyr, zoxamide, boscalid, tiadinil, simeconazole, chlorothalonil, cymoxanil, captan, dithianon, fluazinam, folpet, dichlofluanid,

55 (RS)-N-[2-(1,3-dimethylbutyl)thiophen-3-yl]-1-methyl-3-trifluoromethyl-1*H*-pyrazole-4-carboxamide (penthiopyrad; ISO proposed), oxycarboxin, mepronil, flutolanil, triforine, oxolinic acid, probenazole, acibenzolar-S-methyl, isoprothiolane, ferimzone, diclomezine, pencycuron, fluoroimide, chinomethionate, iminoctadine-triacetate, and iminoctadine-albesilate.

[0086] When the compounds represented by formula (1) of the present invention are combined with at lease one type

Example 2

Production of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 3-(ethylthiocarbonylamino)benzamide (Compound No. 1962)

[0093] To a solution prepared by adding 0.25 g of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 3-aminobenzamide produced in (1-2) of Example 1 and 0.06 g of pyridine to 5 ml of tetrahydrofuran and then stirring the resultant mixture at room temperature was dropwise added a solution of 0.08 g of ethyl chlorothioformate in 1 ml of tetrahydrofuran. After the resultant mixture was stirred for 2 hours, ethyl acetate and water were added to the reaction solution. Then, a separating operation was performed, and an organic layer was separated and then dried with anhydrous magnesium sulfate. The solution was filtered, and then the filtrate was collected, and the solvent of the filtrate was distilled off under reduced pressure. The residue was washed with hexane to obtain 0.27 g (yield 89%) of the title compound as a white solid.
¹H-NMR (CDCl₃+DMSO-d₆, ppm) δ 1.34 (3H, t, J=7.3 Hz), 2.34 (6H, s), 2.96 (2H, q, J=7.3 Hz), 7.33 (2H, s), 7.41 (1H, t, J=7.8 Hz), 7.67 (1H, d, J=7.8 Hz), 7.83-7.85 (1H, m), 8.11 (1H, d, J=2.0 Hz), 8.79 (1H, s), 9.58 (1H, s)

Example 3

Production of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 3-[(4-cyanobenzyl)oxycarbonylamino]benzamide (Compound No. 85)

[0094] To a solution prepared by adding 0.30 g 3-isocyanatobenzoyl chloride to 10 ml of ether and then stirring the resultant mixture at 2°C was dropwise added, over 5 minutes at a temperature kept at 2°C, a solution of 0.23 g of 4-cyanobenzyl alcohol and 0.32 g of tri-n-butylamine in 5 ml of ether. After the resultant mixture was stirred at 2°C for 2 hours, the temperature was returned to room temperature, and then a solution of 0.49 g of 2,6-dimethyl-4-heptafluoroisopropylaniline in 5 ml of ether was dropwise added to the mixture, followed by stirring at room temperature for 8 hours. Then, ethyl acetate was added to the reaction solution, and the reaction solution was washed with water twice. Then, an organic layer was dried with anhydrous magnesium sulfate. The solution was filtered, and then the filtrate was collected, and the solvent of the filtrate was distilled off under reduced pressure. The residue was purified by silica gel column chromatography (eluent; hexane : ethyl acetate = 2:1 to 1:1) to obtain 0.50 g (yield 40%) of the title compound as an oily material.

¹H-NMR (CDCl₃, ppm) δ 2.34 (6H, s), 5.27 (2H, s), 6.97 (1H, broad-s), 7.35 (2H, s), 7.45-7.52 (4H, m), 7.61-7.69 (4H, m), 8.01 (1H, s)

[0095] Similarly, N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 3-[(6-chloropyridine-3-yl)methoxycarbonylamino]benzamide (Compound No. 163) was produced by using 2-chloro-5-hydroxymethylpyridine. ¹H-NMR (CDCl₃, ppm) δ 2.34 (6H, s), 5.22 (2H, s), 6.89 (1H, broad-s), 7.35-7.49 (5H, m), 7.62 (2H, d, J=7.3 Hz), 7.72-7.77 (1H, m), 8.00 (1H, broad-s), 8.45 (1H, d, J=2.4 Hz)

[0096] N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 3-[(tetrahydrofuran-3-yl)methoxycarbonylamino]benzamide (Compound No. 158) was produced by the same process as described above using 3-hydroxymethyltetrahydrofuran except that the solvent was changed to tetrahydrofuran.

¹H-NMR (CDCl₃, ppm) δ 1.66-1.73 (1H, m), 2.05-2.13 (1H, m), 2.34 (6H, s), 2.60-2.70 (1H, m), 3.64-3.68 (1H, m), 3.73-3.79 (1H, m), 3.85-3.92 (2H, m), 4.09-4.15 (2H, m), 6.87 (1H, broad-s), 7.35 (2H, s), 7.46 (2H, t, J=7.8 Hz), 7.61-7.66 (2H, m), 8.01 (1H, broad-s)

Example 4

(4-1) Production of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 3-aminobenzthioamide

[0097] To 10 ml of toluene were added 0.35 g of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 3-aminobenzamide produced in Example (1-2) and 0.19 g of Lawesson's reagent. Then, the resultant mixture was stirred under heating at a reflux temperature for 6 hours. The reaction solution was concentrated under reduced pressure, and the solvent was distilled off. The residue was purified by silica gel column chromatography (eluent; hexane : ethyl acetate = 3:1) to obtain 0.07 g (yield 20%) of the title compound.

¹H-NMR (CDCl₃, ppm) δ 2.36 (6H, s), 3.87 (2H, broad-s), 6.84-6.87 (1H, m), 7.18-7.24 (2H, m), 7.33 (1H, s), 7.39 (2H, s), 8.56 (1H, broad-s)

(5-4) Production of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 6-(2,2,2-trichloroethoxycarbonylamino)pyridine-N-oxide-2-carboxamide (Compound No. 2062)

[0102] To 10 ml of benzene was added 0.26 g of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 6-(2,2,2-trichloroethoxycarbonylamino)pyridine-2-carboxamide produced in Example 5-3, and then the resultant mixture was stirred. Then, 0.08 g of m-chloroperbenzoic acid was added to the mixture at room temperature. After the resultant mixture was stirred at 70°C for 1 hour, 0.2 g of m-chloroperbenzoic acid was further added to the mixture, followed by stirring at 70°C for 7 hours. Then, the mixture was diluted with ethyl acetate, and an organic layer was washed with a saturated aqueous solution of sodium hydrogen carbonate three times and dried with anhydrous magnesium sulfate. Then, the solvent was distilled off under reduced pressure. The residue was purified by silica gel column chromatography (eluent; hexane : ethyl acetate = 10:1) to obtain 0.11 g (yield 41%) of the title compound as an amorphous material.

¹H-NMR (CDCl₃, ppm) δ 2.37 (6H, s), 4.91 (2H, s), 7.36 (2H, s), 7.61 (1H, t, J=8.3 Hz), 8.23 (1H, dd, J=8.3 Hz, 1.9 Hz), 8.45 (1H, dd, J=8.3 Hz, 1.9 Hz), 9.81 (1H, broad-s), 12.70 (1H, broad-s)

[0103] (5-5) Production of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 6-(methylamino)pyridine-2-carboxamide

N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 6-(methylamino)pyridine-2-carboxamide was produced by using N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 6-chloropyridine-2-carboxamide produced in Example 5-1 and a methylamine aqueous solution as reaction materials according to the process described in Example 5-2.

¹H-NMR (DMSO-d₆, ppm) δ 2.30 (6H, s), 2.92 (3H, s), 6.71 (1H, d, J=8.3Hz), 6.85 (1H, d, J=4.9Hz), 7.22 (1H, d, J=7.0Hz), 7.44 (2H, s), 7.55 (1H, dd, J=7.0Hz, 8.3Hz), 10.05 (1H, s)

(5-6) Production of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 6-[N-(2,2,2-trichloroethoxycarbonyl)-N-methylamino]pyridine-2-carboxamide (Compound No. 2168)

[0104] N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 6-[N-(2,2,2-trichloroethoxycarbonyl)-N-methylamino]pyridine-2-carboxamide was produced by using N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 6-(methylamino)pyridine-2-carboxamide produced in Example 5-5 as a starting material according to the process described in Example 5-3.

¹H-NMR(DMSO-d₆, ppm) δ 2.30 (6H, s), 3.61 (3H, s), 5.03 (2H, s), 7.47 (2H, s), 7.92 (1H, d, J=7.6Hz), 7.98 (1H, d, J=7.6Hz), 8.08 (1H, t, J=7.6Hz), 10.18 (1H, s)

Example 6

(6-1) Production of ethyl 3-(2,2,2-trichloroethoxycarbonylamino)benzoate

[0105] To a solution prepared by adding 1.0 g of ethyl m-aminobenzoate and 0.72 g of pyridine to 10 ml of tetrahydrofuran and stirring the resultant mixture at room temperature was dropwise added a solution of 1.55 g of 2,2,2-trichloroethyl chloroformate in 5 ml of tetrahydrofuran. After the resultant mixture was stirred for 2 hours, ethyl acetate and water were added to the reaction solution, and a separating operation was performed. Then, an organic layer was separated and dried with anhydrous magnesium sulfate. The solution was filtered, and then the filtrate was collected, and the solvent of the filtrate was distilled off under reduced pressure. The residue was washed with hexane to obtain 1.89 g (yield 91%) of the title compound.

¹H-NMR (CDCl₃, ppm) δ 1.40 (3H, t, J=7.3Hz), 4.38 (2H, q, J=7.3Hz), 4.84 (2H, s), 6.96 (1H, broad-s), 7.43 (1H, t, J=7.8Hz), 7.76-7.82 (2H, m), 7.99 (1H, t, J=2.0Hz)

(6-2) Production of ethyl 3-[N-methyl-N-(2,2,2-trichloroethoxycarbonyl)amino]benzoate

[0106] To a suspension of 0.14 g of 60% sodium hydride in 5 ml of tetrahydrofuran was dropwise added a solution of 1.0 g of ethyl 3-(2,2,2-trichloroethoxycarbonylamino)benzoate in 5 ml of tetrahydrofuran, and the resultant mixture was stirred at room temperature. Then, a solution of 0.45 g of dimethyl sulfate in 5 ml of tetrahydrofuran was dropwise added, and the resultant mixture was stirred at room temperature for 3 hours. After water was added to the mixture, the mixture was subjected to extraction with ethyl acetate, and an organic layer was washed twice with water and dried with anhydrous magnesium sulfate. Then, the solvent was distilled off under reduced pressure. The residue was purified by silica gel column chromatography (eluent; hexane : ethyl acetate = 4:1) to obtain 0.84 g (yield 79%) of the title compound as an oily material.

¹H-NMR (CDCl₃, ppm) δ 1.40 (3H, t, J=7.1Hz), 3.41 (3H, s), 4.39 (2H, q, J=7.1Hz), 4.77 (2H,s), 7.43-7.52 (2H, m), 7.93-8.01 (2H, m)

at 80°C for 2 hours. Then, the solvent was distilled off under reduced pressure, and the residue was dissolved in 10 ml of tetrahydrofuran. The resultant solution was dropwise added to a solution of 3.24 g of 2,6-dimethyl-4-heptafluoroisopropylaniline and 1.77 g of pyridine in 20 ml of tetrahydrofuran at room temperature, and the mixture was stirred for 5 hours. Then, ethyl acetate and water were added to the reaction solution, and a separating operation was performed.

5 Then, an organic layer was separated and dried with anhydrous magnesium sulfate. The solution was filtered, and then the filtrate was collected, and the solvent of the filtrate was distilled off under reduced pressure. The residue was purified by silica gel column chromatography (eluent; hexane : ethyl acetate = 4:1) to obtain 3.38 g (yield 64%) of the title compound as a solid.

10 $^1\text{H-NMR}$ (CDCl_3 , ppm) δ 2.42 (6H, s), 7.34 (1H, s), 7.37 (1H, s), 7.55 (1H, t, $J=7.8\text{Hz}$), 7.80 (1H, dd, $J=1.5\text{Hz}, 7.8\text{Hz}$), 7.86 (1H, dd, $J=1.5\text{Hz}, 7.8\text{Hz}$), 9.58 (1H, s)

(8-2) Production of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 2-fluoro-3-nitrobenzamide

15 [0112] To 25 ml of N,N-dimethylformamide dried with molecular sieve were added 2.35 g of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 2-chloro-3-nitrobenzamide and 0.87 g of potassium fluoride (spraydried), and the resultant mixture was stirred under heating at 150°C for 3 hours. After the temperature was returned to room temperature, ethyl acetate and water were added to the reaction solution, and a separating operation was performed. Then, an organic layer was separated, washed with water twice, and dried with anhydrous magnesium sulfate. The solution was filtered, and then the filtrate was collected, and the solvent of the filtrate was distilled off under reduced pressure. The residue was purified by silica gel column chromatography (eluent; hexane : ethyl acetate = 4:1) to obtain 1.02 g (yield 45%) of the title compound as a solid.

20 $^1\text{H-NMR}$ (CDCl_3 , ppm) δ 2.37 (6H, s), 7.39 (2H, s), 7.48-7.53 (1H, m), 7.87 (1H, d, $J=11.5\text{Hz}$), 8.23-8.28 (1H, m), 8.42-8.46 (1H, m)

25 (8-3) Production of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 2-fluoro-3-aminobenzamide

[0113] The title compound was produced by using N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 2-fluoro-3-nitrobenzamide produced in Example 8-2 as a starting material according to the same process as in Example 1-2 (yield 72%).

30 $^1\text{H-NMR}$ (CDCl_3 , ppm) δ 2.37 (6H, s), 3.90 (2H, broad-s), 6.96-7.01 (1H, m), 7.10 (1H, t, $J=7.8\text{Hz}$), 7.36 (2H, s), 7.43-7.47 (1H, m), 7.86 (1H, d, $J=13.2\text{Hz}$)

(B-4) Production of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 2-fluoro-3-(isopropoxycarbonylamino)benzamide (Compound No. 1389)

35 [0114] The title compound was produced by using N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 2-fluoro-3-aminobenzamide produced in Example 8-3 as a starting material according to the same process as in Example 7-2 (yield 72%).

40 $^1\text{H-NMR}$ (CDCl_3 , ppm) δ 1.34 (6H, d, $J=6.3\text{Hz}$), 2.36 (6H, s), 5.07 (1H, septet, $J=6.3\text{Hz}$), 6.86 (1H, broad-s), 7.30 (1H, t, $J=8.1\text{Hz}$), 7.37 (2H, s), 7.72-7.79 (2H, m), 8.32 (1H, broad)

40 Example 9

(9-1) Production of 3-[(2,2,2-trichloroethoxy)carbonylamino]benzoic acid

45 [0115] To an aqueous solution (200 ml) of 8.22 g of m-aminobenzoic acid and 4.8 g of sodium hydroxide was dropwise added 25.0 g of 2,2,2-trichloroethyl chloroformate at room temperature. During the dropwise addition, the reaction solution was controlled to pH 10 or more by appropriately adding a 1N sodium hydroxide aqueous solution. After the reaction, the solution was controlled to pH 1 by adding 1N hydrochloric acid, and the precipitates were collected by filtration. The resultant crude crystals were dried and then washed with a ethyl acetate/n-hexane mixed solvent to obtain 16.2 g (yield 87%) of the title compound as a solid.

50 $^1\text{H-NMR}$ (DMSO-d_6 , ppm) δ 4.85 (2H, s), 7.38 (1H, d, $J=7.8\text{Hz}$), 7.75 (1H, d, $J=7.8\text{Hz}$), 7.79-7.80 (1H, m), 8.14 (1H, s), 9.02 (1H, s)

(9-2) Production of 3-[(2,2,2-trichloroethoxy)carbonylamino]benzoyl chloride

55 [0116] To a toluene solution (10 ml) of 1.0 g of 3-[(2,2,2-trichloroethoxy)carbonylamino]benzoic acid produced in Example 9-1 was added 2 ml of thionyl chloride, and the resultant mixture was stirred at 100°C. The solvent was distilled off under reduced pressure, and the residue was dissolved in toluene. The solvent was again distilled off under reduced

(10-2) Production of N-(2,4-bistrifluoromethylphenyl) 3-[(2,2,3,3,3-pentafluoro-n-propyloxy)carbonylamino]benzamide (Compound No. 250)

[0119] First, to an anhydrous tetrahydrofuran solution (15ml) of 0.5 g of N-(2,4-bistrifluoromethylphenyl) 3-isocyanatobenzamide produced in Example 10-1 were added 0.40 g of 2,2,3,3,3-pentafluoro-n-propanol and 0.13 g of triethylamine, and the resultant mixture was stirred at room temperature for 5 hours. The mixture was diluted with ethyl acetate (20 ml), and an organic layer was washed with a 1N sodium hydroxide aqueous solution and 1N hydrochloric acid. The solvent was distilled off under reduced pressure. The residue was purified by silica gel column chromatography (eluent; hexane : ethyl acetate = 4:1) to obtain 0.49 g (yield 70%) of the title compound.

[0120] $^1\text{H-NMR}$ (CDCl_3 , ppm) δ 4.68 (2H, t, $J=13.2\text{Hz}$), 7.08 (1H, broad-s), 7.50-7.59 (2H, m), 7.70 (1H, broad-s), 7.87-7.92 (2H, m), 8.00 (1H, s), 8.39 (1H,s), 8.71 (1H, d, $J=8.8\text{Hz}$)

Example 11

(11-1) Production of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 3-(benzyloxycarbonyl)benzamide

[0120] A mixture of 3.24 g of benzyl alcohol and 2.85 g of pyridine was dropwise added to a tetrahydrofuran solution (60 ml) of 6.09 g of isophthaloyl chloride at room temperature. After the resultant mixture was stirred for 2 hours, a tetrahydrofuran solution (10 ml) of 2,6-dimethyl-4-heptafluoroisopropylaniline was added to the mixture in an ice bath, followed by stirring at room temperature for 2 hours. The reaction solution was diluted with ethyl acetate (50 ml), and an organic layer was washed with 1N hydrochloric acid. The solvent was distilled off under reduced pressure. The residue was purified by silica gel column chromatography (eluent; hexane : ethyl acetate = 9:1) to obtain 9.5 g (yield 60%) of the title compound as an amorphous material.

[0121] $^1\text{H-NMR}$ (CDCl_3 , ppm) δ 2.33 (6H, s), 5.41 (2H,s), 7.34-7.48 (7H,m), 7.56 (1H,s), 7.61 (1H, t, $J=7.8\text{Hz}$), 8.17 (1H, t, $J=7.8\text{Hz}$), 8.28 (1H, d, $J=7.8\text{Hz}$), 8.57 (1H, s)

(11-2) Production of 3-[(2,6-dimethyl-4-heptafluoroisopropylphenyl)aminocarbonyl]benzoic acid

[0121] Catalytic hydrogen reduction was performed at normal pressure by using a methanol solution (20 ml) of 2.0 g of N-(2,6-dimethyl-4-heptafluoroisopropyl)phenyl 3-(benzyloxycarbonyl)benzamide produced in Example 11-1 and 0.2 g of 10% palladium-carbon (wet, 50% product) to produce 1.59 g (yield 96%) of the title compound as a solid.

[0122] $^1\text{H-NMR}$ (CDCl_3 , ppm) δ 2.36 (6H,s), 7.37 (2H,s), 7.59 (1H,s), 7.67 (1H, t, $J=7.8\text{Hz}$), 8.23 (1H, d, $J=7.8\text{Hz}$), 8.32 (1H, d, $J=7.8\text{Hz}$), 8.62 (1H, s)

(11-3) Production of N-(2,6-dimethyl-4-heptafluoroisopropylphenyl) 3-isocyanatobenzamide

[0122] First, to an acetone solution (25 ml) of 1.4 g of -[(2,6-dimethyl-4-heptafluoroisopropylphenyl)aminocarbonyl]benzoic acid produced in Example 11-2 and 0.38 g of triethylamine was added 0.44 g of ethyl chloroformate in an iced water bath, and the resultant mixture was stirred at room temperature for 1 hour. Then, an aqueous solution (10 ml) of 0.32 g of sodium azide was added to the mixture, followed by stirring at room temperature for 2 hours. The reaction solution was poured into iced water (150 ml), and the precipitates were extracted with ethyl acetate (50 ml) and then dried with anhydrous magnesium sulfate. After anhydrous magnesium sulfate was filtered off, toluene (50 ml) was added to the filtrate, and the low-boiling-point solvent was distilled off by heating to 110°C using a Dean and Stark tube. After the end of gas generation was confirmed, the temperature was returned to room temperature, and then the residual solvent was distilled off under reduced pressure to obtain 1.23 g (yield 88%) of the title compound as a solid.

[0123] $^1\text{H-NMR}$ (CDCl_3 , ppm) δ 2.35 (6H, s), 7.32 (1H, d, $J=7.8\text{Hz}$), 7.37 (2H,s), 7.39 (1H,s), 7.49 (1H, t, $J=7.8\text{Hz}$), 7.67 (1H, s), 7.72 (1H, d, $J=7.8\text{Hz}$)

(11-4) Production of N-(2,6-dimethyl-4-heptafluoroisopropylphenyl) 3-[(1-chloro-3-trifluoromethyl-2-propyl)oxygen]amino]benzamide (Compound No. 120)

[0123] The title compound was produced by using N-(2,6-dimethyl-4-heptafluoroisopropylphenyl) 3-isocyanatobenzamide produced in Example 11-3 according to the process described in Example 10-2. $^1\text{H-NMR}$ (CDCl_3 , ppm) δ 2.35 (6H, s), 3.75-3.83 (2H, m), 4.46-4.80 (2H, m), 5.19-5.24 (1H,m), 6.97 (1H, broad-s), 7.36 (2H, s), 7.36-7.48 (2H, m), 7.60-7.66 (2H, m), 8.03 (1H, s)

[0124] The following compounds were produced according to the processes described in Examples 10 and 11.

N-2,6-dimethyl-4-(nonafluoro-2-butyl)phenyl 3-isocyanatobenzamide

N-2,6-dimethyl-4-[(heptafluoro-n-propyl)thio]phenyl 3-isocyanatobenzamide

¹H-NMR (CDCl₃, ppm) δ 3.89 (2H, broad-s), 6.90 (1H, dt, J=2.5Hz, 6.4Hz), 7.28-7.30 (3H, m), 7.60 (1H, s), 7.93 (2H, s)

(12-5) Production of N-[2,6-dibromo-4-(heptafluoro-n-propylthio)]phenyl 3-(2,2,2-trichloroethoxycarbonylamino)benzamide (Compound No. 612)

[0129] To a solution prepared by adding 0.10 g of N-[2,6-dibromo-4-(heptafluoro-n-propylthio)]phenyl 3-aminobenzamide and 0.02 g of pyridine to 5 ml of tetrahydrofuran and stirring the resultant mixture at room temperature was dropwise added a solution of 0.04 g of 2,2,2-trichloroethyl chloroformate in 1 ml of tetrahydrofuran. After reaction for 2 hours, ethyl acetate and water were added to the reaction solution, and a separating operation was performed. Then, an organic layer was separated and dried with anhydrous magnesium sulfate. The solution was filtered, and then the filtrate was collected, and the solvent of the filtrate was distilled off under reduced pressure. The residue was purified by silica gel column chromatography (eluent; hexane : ethyl acetate = 4:1) to obtain 0.11 g (yield 84%) of the title compound as a solid. ¹H-NMR (CDCl₃, ppm) δ 4.86 (2H, s), 7.45 (1H, t, J=7.8Hz), 7.72 (1H, d, J=7.8Hz), 7.93 (2H, s), 7.94 (1H, broad-s), 8.13 (1H, s), 9.02 (1H, s), 9.17 (1H, s)

(12-6) Production of N-[2,6-dibromo-4-(heptafluoro-n-propylsulfinyl)]phenyl 3-nitrobenzamide and N-[2,6-dibromo-4-(heptafluoro-n-propylsulfonyl)]phenyl 3-nitrobenzamide

[0130] A solution prepared by adding 0.5 g of N-[2,6-dibromo-4-(heptafluoro-n-propylthio)]phenyl 3-nitrobenzamide to 15 ml of chloroform was stirred at room temperature, and 0.5 g of m-chloroperbenzoic acid was added to the mixture. After the resultant mixture was stirred at room temperature for 1 week, an aqueous solution of sodium hydrogen sulfite was added to the mixture, followed by stirring. Then, an organic layer was separated and washed with a 1N sodium hydroxide aqueous solution and saturated saline water. Then, the solvent was distilled off under reduced pressure. The residue was purified by silica gel column chromatography (eluent; hexane : ethyl acetate = 4:1) to obtain 0.21 g of N-[2,6-dibromo-4-(heptafluoro-n-propylsulfinyl)]phenyl 3-nitrobenzamide and 0.12 g of N-[2,6-dibromo-4-(heptafluoro-n-propylsulfonyl)]phenyl 3-nitrobenzamide as solids.

(sulfinyl compound) ¹H-NMR (CDCl₃, ppm) δ 7.76-7.82 (2H, m), 8.06 (1H, s), 8.29 (1H, s), 8.33-8.35 (1H, m), 8.49-8.53 (1H, m), 8.81 (1H, s)

(12-7) Production of 2,6-dimethyl-4-(heptafluoro-n-propylthio)aniline

[0131] To 20 ml of DMF were added 3.0 g (1.3 mmol) of 2,6-dibromo-4-heptafluoro-n-propylthioaniline, 3.0 g (21.9 mmol) of potassium carbonate, 0.75 g (0.65 mmol) of tetrakis(triphenylphosphine) palladium, and 0.17 g (1.3 mmol) of trimethylboroxine, and the resultant mixture was stirred at 135°C for 6 hours. After the reaction solution was cooled to room temperature, insoluble materials were filtered off with cerite. The filtrate was concentrated under reduced pressure. The residue was purified by silica gel column chromatography (eluent; n-hexane : ethyl acetate = 12:1 to 4:1) to obtain 1.17 g (yield 55%) of the title compound as an oily material.

¹H-NMR (CDCl₃, ppm) δ 2.17 (6H, s), 3.86 (2H, broad-s), 7.22 (2H, s)

[0132] The following aniline derivatives can be produced according to the processes described in Examples 12-1, 12-2, 12-6, and 12-7. 2-methyl-4-(pentafluoroethylthio)aniline 2-methyl-4-(heptafluoro-n-propylthio)aniline

¹H-NMR (CDCl₃, ppm) δ 2.16 (3H, s), 3.90 (2H, broad-s), 6.65 (1H, d, J=8.3Hz), 7.28-7.31 (2H, m)

2-bromo-4-(heptafluoro-n-propylthio)aniline

¹H-NMR (CDCl₃, ppm) δ 4.44 (2H, broad-s), 6.75 (1H, d, J=8.8Hz), 7.36 (1H, dd, J=2.0Hz, 8.8Hz), 7.69 (1H, d, J=2.0Hz)

2-methyl-4-(heptafluoroisopropylthio)aniline

2-methyl-4-(nonafluoro-n-butylthio)aniline

2-methyl-4-(pentafluoroethylsulfinyl)aniline

2-methyl-4-(heptafluoro-n-propylsulfinyl)aniline

2-methyl-4-(heptafluoroisopropylsulfinyl)aniline

2-methyl-4-(nonafluoro-n-butylsulfinyl)aniline

2-methyl-4-(pentafluoroethylsulfonyl)aniline

2-methyl-4-(heptafluoro-n-propylsulfonyl)aniline

2-methyl-4-(heptafluoroisopropylsulfonyl)aniline

2-methyl-4-(nonafluoro-n-butylsulfonyl)aniline

2,6-dichloro-4-(pentafluoroethylthio)aniline

2,6-dibromo-4-(pentafluoroethylthio)aniline

N-[2,6-dibromo-4-(pentafluoroethylthio)]phenyl 3-nitrobenzamide ¹H-NMR (CDCl₃, ppm) δ 7.73 (1H, s), 7.77 (1H, t, J=7.8Hz), 7.96 (2H, s), 8.32 (1H, d, J=7.8Hz), 8.47-8.50 (1H, m), 8.80 (1H, t, J=2.0Hz)

2,6-dimethyl-4-(pentafluoroethylthio)aniline

Example 13

(13-1) Production of 2,6-dimethyl-4-(1,1,1,3,3-hexafluoro-2-hydroxy-2-propyl)aniline

- 5 [0133] A mixture of 2.42 g of 2,6-dimethylaniline, 7.35 g of hexafluoroacetone hydrate, and 0.04 g of p-toluenesulfonic acid monohydrate was stirred under heating at 100°C for 5 hours. After the temperature was returned to room temperature, the mixture was diluted with ethyl acetate and washed with a 1N sodium hydroxide aqueous solution. Then, the solvent was distilled off under reduced pressure, and the precipitated crude crystals were washed with a n-hexane-ethyl acetate mixed solvent to obtain 4.47 g (yield 78%) of the title compound as a solid.
- 10 ¹H-NMR (CDCl₃, ppm) δ 2.20 (6H, s), 3.26 (1H, broad-s), 3.76 (2H, broad-s), 7.25 (2H, s)

(13-2) Production of N-[2,6-dimethyl-4-(1,1,1,3,3-hexafluoro-2-hydroxy-2-propyl)]phenyl 3-(2,2,2-trichloroethoxycarbonylamino)benzamide (Compound No. 872)

- 15 [0134] The title compound was produced as an amorphous material by using 2,6-dimethyl-4-(1,1,1,3,3-hexafluoro-2-hydroxy-2-propyl)aniline produced in Example 13-1 as a starting material according to the process described in Example 9-3 (yield 92%). ¹H-NMR (CDCl₃, ppm) δ 2.31 (6H, s), 3.99 (1H, s), 4.85 (2H, s), 7.15 (1H, broad-s), 7.45-7.51 (4H, m), 7.64-7.66 (2H, m), 8.01 (1H, s)

- 20 [0135] Formulation examples containing the compounds represented by formula (1) of the present invention as active ingredients are shown below, however the present invention is not limited to these examples. In each of the formulation examples, "part(s)" represents "part(s) by weight".

Formulation Example 1

- 25 [0136] A mixture of 20 parts of a compound represented by formula (1) of the present invention, 10 parts of Sorpol 355S (surfactant produced by Toho CChemical Industry Co., Ltd.), and 70 parts of xylene was uniformly stirred to produce an emulsion.

Formulation Example 2

- 30 [0137] A mixture of 10 parts of a compound represented by formula (1) of the present invention, 2 parts of sodium alkylnaphthalenesulfonate, 1 part of sodium lignin-sulfonate, 5 parts of white carbon, and 82 parts of diatomite was uniformly stirred to produce a wettable powder.

Formulation Example 3

- 35 [0138] A mixture of 0.3 parts of a compound represented by formula (1) of the present invention and 0.3 parts of white carbon was uniformly stirred, and 99.2 parts of clay and 0.2 parts of Driless A (produced by Sankyo Co., Ltd.) were added to the mixture. The resultant mixture was uniformly ground to produce a dust.

Formulation Example 4

- 40 [0139] A mixture of 2 parts of a compound represented by formula (1) of the present invention, 2 parts of white carbon, 2 parts of sodium lignin-sulfonate, and 94 parts of bentonite was uniformly ground, and then water was added to the mixture. The resultant mixture was kneaded, granulated and then dried to produce granules.

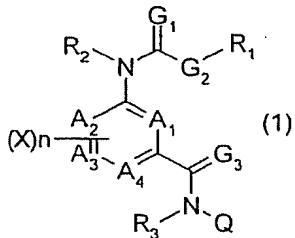
Formulation Example 5

- 45 [0140] A mixture of 20 parts of a compound represented by formula (1) of the present invention and 5 parts of a 20% aqueous solution of polyvinyl alcohol was sufficiently stirred, and then 75 parts of a 0.8% aqueous solution of xanthane gum was added to the mixture. Then, the resultant mixture was again stirred to produce a flowable agent.

[0141] Test examples for making clear that the compounds represented by formula (1) of the present invention have excellent insecticidal activity are shown below, however the present invention is not limited to these examples.

55 Test Example 1 Insecticidal test for common cutworm (*Spodoptera litura*)

[0142] A cabbage leaf piece was immersed in a solution prepared by diluting a test compound to a predetermined concentration for 30 seconds, and then dried in air. Then, the cabbage leaf piece was placed in a polyethylene cup of



wherein A₁, A₂, A₃, and A₄ independently represent a carbon atom, a nitrogen atom, or an oxidized nitrogen atom; R₁ represents a C1-C6 alkyl group which may be substituted, a phenyl group which may be substituted, a naphthyl group which may be substituted, or a heterocyclic group which may be substituted; R₂ and R₃ independently represent a hydrogen atom, a C1-C4 alkyl group which may be substituted, or a C1-C4 alkylcarbonyl group which may be substituted; G₁, G₂, and G₃ independently represent an oxygen atom or a sulfur atom; Xs may be the same or different and each represent a hydrogen atom, a halogen atom, a C1-C4 alkyl group which may be substituted, or an amino group which may be substituted; n represents an integer of 0 to 4; Q represents a phenyl group which may be substituted, a naphthyl group which may be substituted, a tetrahydronaphthyl group which may be substituted, or a heterocyclic group which may be substituted.

- 20
2. The compound according to claim 1, wherein in formula (1), A₁, A₂, A₃, and A₄ independently represent a carbon atom, a nitrogen atom, or an oxidized nitrogen atom; R₁ represents:

25

- a C1-C6 alkyl group,
- a C1-C6 haloalkyl group,
- a C2-C6 alkenyl group,
- a C2-C6 haloalkenyl group,
- a C2-C6 alkynyl group,
- a C2-C6 haloalkynyl group,

30

- a C3-C8 cycloalkyl group,
- a C3-C8 halocycloalkyl group,
- a phenyl group,
- a substituted phenyl group having one or more substituents which may be the same or different and which are selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, a pentafluorosulfanyl group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, a C1-C4 alkylcarbonyloxy group, and a C1-C4 alkoxy carbonyl group,

35

- a naphthyl group,
- a substituted naphthyl group having one or more substituents which may be the same or different and which are selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, a pentafluorosulfanyl group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, a C1-C4 alkylcarbonyloxy group, and a C1-C4 alkoxy carbonyl group,

40

- a heterocyclic group (which represents a pyridyl group, a pyridine-N-oxide group, a pyrimidinyl group, a tetrahydrofuryl group, a thieryl group, a tetrahydrothienyl group, a tetrahydropyranyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, a pyrrole group, an imidazolyl group, a triazolyl group, a pyrazolyl group, or a tetrazolyl group),

45

- a substituted heterocyclic group (which represents a pyridyl group, a pyridine-N-oxide group, a pyrimidinyl group, a pyridazyl group, a furyl group, a tetrahydrofuryl group, a thieryl group, a tetrahydrothienyl group, a tetrahydropyranyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, a pyrrole group, an imidazolyl group, a triazolyl group, a pyrazolyl group, or a tetrazolyl group) having one or more substituents which may be the same or different and which are selected from a halogen atom, a

50

55

haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, a pentafluorosulfanyl group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, a C1-C4 alkylcarbonyloxy group, and a C1-C4 alkoxy carbonyl group,

5 a naphthyl group,

a substituted naphthyl group having one or more substituents which may be the same or different and which are selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, a pentafluorosulfanyl group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, a C1-C4 alkylcarbonyloxy group, and a C1-C4 alkoxy carbonyl group,

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a heterocyclic group (which represents a pyridyl group, a pyridine-N-oxide group, a pyrimidinyl group, a pyridazinyl group, a furyl group, a tetrahydrofuryl group, a thienyl group, a tetrahydrothienyl group, a tetrahydropyranyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, a pyrrole group, an imidazolyl group, a triazolyl group, a pyrazolyl group, or a tetrazolyl group), or

15

thiadiazolyl group, a pyrrole group, an imidazolyl group, a triazolyl group,

20

a furyl group, a tetrahydronaphthalenyl group, a trienyl group, a tetrahydrofuryl group, a tetrahydropyranyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, a pyrrole group, an imidazolyl group, a triazolyl group, a pyrazolyl group, or a tetrazolyl group) having one or more substituents which may be the same or different and which are selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, a pentafluorosulfanyl group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, a C1-C4 alkylcarbonyloxy group, and a C1-C4 alkoxycarbonyl group);

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P₁ and P₂ independently represent a hydrogen atom, a C₁-C₄ alkyl group, a C₁-C₄ alkylcarbonyl group, or a C₁-C₄ alkoxycarbonyl group;

31

C1-C4 haloalkylcarbonyl group; G₁, G₂, and G₃ independently represent an oxygen atom or a sulfur atom, X₅ may be the same or different and each represent a hydrogen atom, a halogen atom, a C1-C4 alkyl group, a C1-C4 haloalkyl group, a C1-C4 alkoxy group, a C1-C4 haloalkoxy group, a C1-C4 alkylthio group, a C1-C4 haloalkylthio group, a C1-C4 alkylsulfinyl group, a C1-C4 haloalkylsulfinyl group, a C1-C4 alkylsulfonyl group, a C1-C4 haloalkylsulfonyl group, a cyano group, a nitro group, an amino group, or an amino group which may be substituted by a C1-C4 alkyl group.

35

be substituted by a C1-C4 alkyl group

Q represents a phenyl group,

selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-

be substituted by at least one hydroxyl group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a C1-C6 haloalkylsulfonyloxy group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, a cyano group, a nitro group, a hydroxyl group, a pentafluorosulfanyl group, a phenyl group, a substituted phenyl group (which may have the same or different substituents selected from a halogen atom, a C1-C6 alkyl group,

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group (which may have the same or different substituents selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a C1-C6 haloalkylsulfonyloxy, a cyano group, a nitro group, a hydroxyl group, and a pentafluorosulfanyl group), a thiényl group,

5

and a substituted thiienyl group (which may have the same or different substituents selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a C1-C6 haloalkylsulfonyloxy group, a cyano group, a nitro group, a hydroxyl group, and a pentafluorosulfanyl group).

5

sulfanyl group),

¹ A naphthyl group, which is a naphthalene ring substituted with a phenyl group.

C₆ alkylsulfonyl group, a C₁-C₆ haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, and a pentafluorosulfanyl group.

4. The compound according to claim 3, wherein in formula (1), X_s may be the same or different and each represent a hydrogen atom, a halogen atom, a C₁-C₄ alkyl group, or a trifluoromethyl group, and n is an integer of 0 to 4.

5. The compound according to claim 4, wherein in formula (1), R₁ represents:

10 a C₁-C₆ alkyl group,
a C₁-C₆ haloalkyl group,
a C₂-C₆ alkenyl group,
a C₂-C₆ haloalkenyl group,
a C₂-C₆ alkynyl group,

15 a C₂-C₆ haloalkynyl group,
a C₃-C₈ cycloalkyl group,
a C₃-C₈ halocycloalkyl group,

-E₁-Z₁-R₄

(wherein E₁ represents a C₁-C₄ alkylene group, a C₂-C₄ alkenylene group, a C₃-C₄ alkynylene group, a C₁-C₄ haloalkylene group, a C₂-C₄ haloalkenylene group, or a C₃-C₄ haloalkynylene group, R₄ represents a hydrogen atom, a C₁-C₆ alkyl group, a C₂-C₆ alkenyl group, a C₂-C₆ alkynyl group, a C₁-C₆ haloalkyl group, a C₂-C₆ haloalkenyl group, a C₂-C₆ haloalkynyl group, and Z₁ represents -O-, -S-, -SO-, or -SO₂-, or -E₂-R₆)

20 (wherein E₂ represents a C₁-C₄ alkylene group, a C₂-C₄ alkenylene group, a C₃-C₄ alkynylene group, a C₁-C₄ haloalkylene group, a C₂-C₄ haloalkenylene group, or a C₃-C₄ haloalkynylene group, and R₆ represents a C₃-C₈ cycloalkyl group, a C₃-C₈ halocycloalkyl group, a cyano group,

25 a nitro group,

a hydroxyl group,

a phenyl group,

30 a substituted phenyl group having one or more substituents which may be the same or different and which are selected from a halogen atom, a C₁-C₆ alkyl group, a C₁-C₆ haloalkyl group, a C₁-C₆ alkoxy group, a C₁-C₆ haloalkoxy group, a C₁-C₆ alkylthio group, a C₁-C₆ haloalkylthio group, a C₁-C₆ alkylsulfinyl group, a C₁-C₆ haloalkylsulfinyl group, a C₁-C₆ alkylsulfonyl group, a C₁-C₆ haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, a C₁-C₄ alkylcarbonyl group, a C₁-C₄ haloalkylcarbonyl group, a C₁-C₄ alkylcarbo-

35 nyloxy group, a C₁-C₄ alkoxy carbonyl group, and a pentafluorosulfanyl group,

a pyridyl group,

40 a substituted pyridyl group having one or more substituents selected from a halogen atom, a C₁-C₆ haloalkyl group, and a C₁-C₆ haloalkoxy group,

a thienyl group, or a tetrahydrofuryl group).

- 40 6. The compound according to claim 5, wherein in formula (1), A₁, A₂, A₃, and A₄ are all carbon atoms, or one any of A₁, A₂, A₃, and A₄ is a nitrogen atom or an oxidized nitrogen atom, and G₂ is an oxygen atom.

7. The compound according to claim 6, wherein in formula (1), Q represents a phenyl group,

45 a substituted phenyl group having one or more substituents which may be the same or different and which are selected from a halogen atom, a C₁-C₆ alkyl group, a C₁-C₆ haloalkyl group, a C₁-C₆ alkoxy group, a C₁-C₆ haloalkoxy group, a C₁-C₆ haloalkyl group which may be substituted by at least one hydroxyl group, a C₁-C₆ alkylthio group, a C₁-C₆ haloalkylthio group, a C₁-C₆ alkylsulfinyl group, a C₁-C₆ haloalkylsulfinyl group, a C₁-C₆ alkylsulfonyl group, a C₁-C₆ haloalkylsulfonyl group, a pentafluorosulfanyl group, a cyano group, and a nitro group;

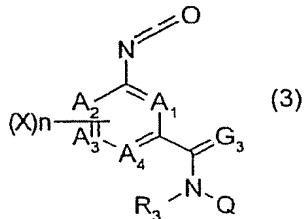
50 a pyridyl group, or

55 a substituted pyridyl group having one or more substituents which may be the same or different and which are selected from a halogen atom, a C₁-C₆ alkyl group, a C₁-C₆ haloalkyl group, a C₁-C₆ alkoxy group, a C₁-C₆ haloalkoxy group, a C₁-C₆ haloalkyl group which may be substituted by at least one hydroxyl group, a C₁-C₆ alkylthio group, a C₁-C₆ haloalkylthio group, a C₁-C₆ alkylsulfinyl group, a C₁-C₆ haloalkylsulfinyl group, a C₁-C₆ alkylsulfonyl group, a C₁-C₆ haloalkylsulfonyl group, a pentafluorosulfanyl group, a cyano group, and a nitro group.

- 55 8. The compound according to claim 7, wherein in formula (1), Q is a substituent represented by formula (1-2) or (1-3):

a C1-C4 haloalkylsulfonyl group, a cyano group, a nitro group, or an amino group which may be substituted by a C1-C4 alkyl group;
n represents an integer of 0 to 4; and
Hal represents a halogen atom (excluding a case in which R1 is an unsubstituted benzyl group when X is a hydrogen atom.)

10. A compound represented by formula (3):



wherein A₁, A₂, A₃, and A₄ independently represent a carbon atom, a nitrogen atom, or an oxidized nitrogen atom; R₃ represents a hydrogen atom, a C1-C4 alkyl group, a C1-C4 alkylcarbonyl group, or a C1-C4 haloalkylcarbonyl group; G₃ represents an oxygen atom or a sulfur atom; X_s may be the same or different and each represent a hydrogen atom, a halogen atom, a C1-C4 alkyl group, a C1-C4 haloalkyl group, a C1-C4 alkoxy group, a C1-C4 haloalkoxy group, a C1-C4 alkylthio group, a C1-C4 haloalkylthio group, a C1-C4 alkylsulfinyl group, a C1-C4 haloalkylsulfinyl group, a C1-C4 alkylsulfonyl group, a C1-C4 haloalkylsulfonyl group, a cyano group, a nitro group, or an amino group which may be substituted by a C1-C4 alkyl group;

n represents an integer of 0 to 4; and

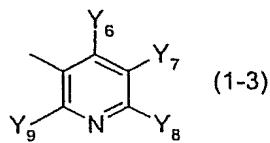
Q represents a phenyl group,

a substituted phenyl group having one or more substituents which may be the same or different and which are selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 haloalkyl group which may be substituted by at least one hydroxyl group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a C1-C6 haloalkylsulfonyloxy group, a C1-C4 alkylcarbonyl group, a C1-C4 haloalkylcarbonyl group, a cyano group, a nitro group; a hydroxyl group, a pentafluorosulfanyl group, a phenyl group, a substituted phenyl group (which may have the same or different substituents selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a C1-C6 haloalkylsulfonyloxy group, a cyano group, a nitro group, a hydroxyl group, and a pentafluorosulfanyl group), a thiienyl group, a substituted thiienyl group (which may have the same or different substituents selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a C1-C6 haloalkylsulfonyloxy group, a cyano group, a nitro group, a hydroxyl group, and a pentafluorosulfanyl group), a naphthyl group,

a substituted naphthyl group having one or more substituents which may be the same or different and which are selected from a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C3-C8 cycloalkyl group, a C3-C8 halocycloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 haloalkyl group which may be substituted by at least one hydroxyl group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a cyano group, a nitro group, a hydroxyl group, and a pentafluorosulfanyl group,

a heterocyclic group (which represents a pyridyl group, a pyridine-N-oxide group, a pyrimidinyl group, a pyridazinyl group, a furyl group, a thiienyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, a pyrrole group, an imidazolyl group, a triazolyl group, a pyrazolyl group or a tetrazolyl group),

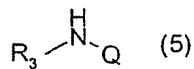
a substituted heterocyclic group (which represents a pyridyl group, a pyridine-N-oxide group, a pyrimidinyl group, a pyridazinyl group, a furyl group, a thiienyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, a pyrrole group, an imidazolyl group, a triazolyl group, a pyrazolyl group or a tetrazolyl group),



10 (wherein Y₆, Y₇, and Y₉ may be the same or different and each represent a hydrogen atom, a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-C6 haloalkylsulfinyl group, a C1-C6 alkylsulfonyl group, a C1-C6 haloalkylsulfonyl group, a pentafluorosulfanyl group, a cyano group, or a nitro group, and Y₈ represents a C1-C6 haloalkyl group, a C1-C6 haloalkoxy group, a C1-C6 haloalkyl group which may be substituted by at least one hydroxyl group, a C1-C6 haloalkylthio group, a C1-C6 haloalkylsulfinyl group, a C1-C6 haloalkylsulfonyl group, or a pentafluorosulfanyl group, but only one of Y₆ and Y₉ represents a hydrogen atom).

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12. A method for producing the compound according to claim 1, the method comprising reacting the compound represented by formula (2) according to claim 9 with a compound represented by formula (5) :



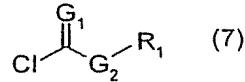
25 wherein R₃ and Q each represent the same as in claim 1.

13. A method for producing the compound according to claim 1, the method comprising reacting the compound represented by formula (3) according to claim 10 with a compound represented by formula (6):



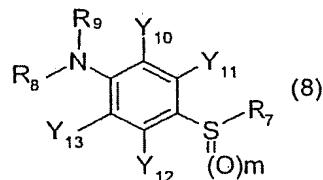
wherein R₁ and G₂ each represent the same as in claim 1.

- 35 14. A method for producing the compound according to claim 1, the method comprising reacting the compound represented by formula (4) according to claim 11 with a compound represented by formula (7):



wherein R₁, G₁, and G₂ each represent the same as in claim 1.

- 45 15. An aniline derivative represented by formula (8):



55 wherein R₇ represents a C1-C6 haloalkyl group, Y₁₀, Y₁₁, Y₁₂, and Y₁₃ may be the same or different and each represent a hydrogen atom, a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C1-C6 alkoxy group, a C1-C6 haloalkoxy group, a C1-C6 alkylthio group, a C1-C6 haloalkylthio group, a C1-C6 alkylsulfinyl group, a C1-

acephate, isofenphos, salithion, DEP, EPN, ethion, mecarbam, pyridafenthion, diazinon, pirimiphos-methyl, etrimfos, isoxathion, quinalphos, chlorpyrifos-methyl, chlorpyrifos, phosalone, phosmet, methidathion, oxydeprofos, vamidothion, malathion, phentoate, dimethoate, formothion, thiometon, ethylthiometon, phorate, terbufos, profenofos, prothiofos, sulprofos, pyraclofos, monocrotophos, naled, fosthiazate, and cadusafos; carbamate insecticides such as NAC, MTMC, MIPC, BPMC, XMC, PHC, MPMC, ethiofencarb, bendiocarb, pirimicarb, carbosulfan, benfuracarb, methomyl, oxamyl, and aldicarb; arylpropylether insecticides such as etofenprox and halfenprox; silylether insecticides such as silafluofen; insecticidal natural products such as nicotine-sulfate, polynactin complex, abamectin, milbemectin, and BT agents; insecticides such as, cartap, thiocyclam, bensultap, diflubenzuron, chlорfluazuron, teflubenzuron, triflumuron, flufenoxuron, flucycloxuron, hexaflumuron, fluazuron, imidacloprid, nitenpyram, acetamiprid, dinotefuran, pymetrozine, fipronil, buprofezin, fenoxy carb, pyriproxyfen, methoprene, hydroprene, kinoprene, diafenthiuron, triazamate, tebufenozone, and endosulfan; acaricides such as dicofol, chlorobenzilate, bromopropylate, tetradifon, CPCBS, BPPS, chinomethionate, amitraz, benzoximate, hexythiazox, fenbutatin oxide, cyhexatin, dienochlor, clofentezine, pyridaben, fenpyroximate, fenazaquin, and tebufenpyrad; novaluron; noviflumuron; emamectin benzoate; clothianidin; thiacloprid; thiamethoxam; flupyrazofos; acequinocyl; bifenazate; chromafenozide; etoxazole; fluacrypyrim; flufenazine; halofenozone; indoxacarb; methoxyfenozide; spirodiclofen; tolfenpyrad; gamma-cyhalothrin; ethiprole; amidoflumet; bistrifluron; flonicamid; flubrocythrinate; flufenerim; pyridalyl; pyrimidifen; spinosad; and spiromesifen.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/012416

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 58-192858 A (SUMITOMO CHEMICAL CO., LTD.), 10 November, 1983 (10.11.83), Claims	1-8,17-21
A	JP 62-132862 A (Bayer AG.), 16 June, 1987 (16.06.87), Claims	1-8,17-21
A	JP 2-149502 A (Schering Agrochemicals Ltd.), 08 June, 1990 (08.06.90), Claims	1-8,17-21
A	JP 11-511442 A (Bayer AG.), 05 October, 1999 (05.10.99), Claims	1-8,17-21

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2004/012416

Continuation of Box No.III of continuation of first sheet(2)

Consequently, the matter common to these six inventions is not a special technical feature. Therefore, these six inventions are not considered to be so linked as to form a single general inventive concept.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2004/012416

JP 58-192858 A	1983.11.10	US 4690946 A
JP 62-132862 A	1987.06.16	DE 3602016 A EP 226837 A AU 8665877 A ZA 8609159 A BR 8605956 A DK 8605839 A HU 45372 T DD 265317 A US 4871387 A
JP 2-149502 A	1990.06.08	EP 360417 A DK 8904151 A AU 8940095 A ZA 8906427 A US 5093364 A
JP 11-511442 A	1999.10.05	WO 97/08135 A1 ZA 9607317 A AU 9668740 A DE 19626311 A1 EP 848700 A1 CZ 9800610 A3 SK 9800271 A3 CN 1200725 A HU 9802859 A2 BR 9610048 A US 6001879 A MX 9801597 A1 KR 99044134 A TW 379212 A US 6548549 B1 DE 59610577 G TW 521069 A